ARCHIVES OF OPHTHALMOLOGY.

A FIFTH CASE OF ACUTE DISSEMINATED MYELITIS WITH RETROBULBAR INFLAMMATION OF THE OPTIC NERVES.

BY DR. WARD A. HOLDEN, NEW YORK.

IN No. 6, vol. xl., of these ARCHIVES, and in vol. xii., part iii., of the *Transactions* of the American Ophthalmological Society, I published "A Report of Four Cases of Acute Disseminated Myelitis with Retrobulbar Degeneration of the Optic Nerves."

The captions of these cases were: (1) An Ascending Spinal Myelitis Following a Partial Degeneration of One Optic Nerve; (2) An Ascending Myelitis with Pallor of Both Optic Disks; (3) A Myelitis with Complete Atrophy of One Optic Nerve, and (4) An Ascending Myelitis Immediately Following Retrobulbar Neuritis in Both Eyes.

The fifth case, which I report here, may be called *Acute Spinal Myelitis with Retrobulbar Inflammation in Both Optic Nerves*, causing complete blindness of one eye and almost complete blindness of the other, with subsequent restoration of useful vision in each. This single case is put on record because it completes the series, which now probably represents all the varieties of this spinal-cord and optic-nerve affection that one will encounter. Furthermore, the case is of interest since in it, as in two of the three earlier cases in which the field of vision could be taken, there was a lateral hemianopia in the field of one eye only. This symptom, not mentioned by earlier writers, we may henceforth regard as important in the diagnosis of this rare and little understood disease.

The opening explanatory paragraphs of the earlier paper are reprinted here in quotation marks:

"All four patients, adults, seen in 1910 at the Neurological Institute of New York, had sensory disturbances in the trunk and limbs and more or less complete paraplegia. These conditions continue to the present time in two patients, while the other two patients died of respiratory paralysis."

"Retrobulbar neuritis may precede, accompany, or follow myelitis, but it is no longer regarded as being dependent upon the myelitis. The two have a common cause—a noxious matter circulating in the blood. In this disease, foci of degeneration appear scattered through the spinal cord, and the vessels which run in from the pial sheath to those foci are surrounded by cellular infiltrations. Bielschowsky has found similar changes in the optic nerves and tracts in cases of myelitis. It is still uncertain whether these inflammatory changes are caused by bacteria or whether they are due to the action of toxins."

"The fact that these foci of degeneration have an accidental distribution along the arteries entering the optic nerve from the pial sheath would lead us to expect ocular clinical pictures that are unusual, and indeed in two of the cases to be reported here, there were defects in the fields of one eye of a hemianopic character, and in one case there was excessive concentric contraction of the fields of one eye with fair central vision."

CASE 5.—A. C., aged 43, a weigher on the docks, came to the Neurological Institute in Dr. Fraenkel's service, July 9, 1912, giving the following history:

About March 10, 1912, he noticed a numbness in the soles of his feet which gradually ascended until the entire body below the clavicles was numb, and with this the entire body soon became weak, so that when on April 10th he entered the Kings County Hospital his body was completely paralyzed and anæsthetic, with rectal and vesical incontinence. He states that his Wassermann blood reaction was found to be negative, but that he was put on mixed treatment. After three weeks he began to improve and in six weeks he was able to walk.

On the 10th of June, 1912 (three months after the onset), he noticed that the vision of the right eye was obscured and he felt severe pains in the right eye and temple, and there was fever. Ten days later the right eye was completely

blind and on July 1st he noticed that the vision of the left eye was becoming obscured.

Examination, July 9, 1912.—The patient denied syphilis, and the Wassermann blood reaction was negative. He had taken whiskey to excess. His arms were weak, with tremor of both hands. His gait was unsteady. The knee, ankle, and arm-jerks were increased, but there was no clonus. Sensibility everywhere was normal, and there were no speech defects.

Eyes: The corneal sensibility was normal. The right pupil was *7mm*, round, with no light reaction, but fair convergence reaction; the left pupil was *5mm*, round, with prompt light and convergence reactions. The mobility was normal. Vision: Right, no perception of light; Left, fingers counted at three feet in the nasal half of the field. The left field for a *1cm* white test-object showed a *temporal hemianopia sharp below, and slightly encroaching upon the nasal half of the field above the point of fixation.* Both optic disks were slightly pink, with pallor of their infero-temporal sectors and blurred outlines.

A diagnosis of ascending spinal myelitis followed by retrobulbar inflammation of the optic nerves was made, and, since the recovery from the myelitis had been so complete, a good prognosis as regards vision was given. Strychnia was administered.

Subsequent History: On September 24, 1912, the pupils were *5mm* each, reactions good. Vision had improved to R. V. = $\frac{10}{200}$, L. V. = $\frac{15}{200}$. The right field for a *1cm* white test-object was nearly normal, red was not recognized; the left field for a *1cm* white test-object was nearly normal, and red was recognized in the nasal half of the field only.

January 28, 1913, vision was $\frac{20}{100}$ each, a high degree of astigmatism was found, the fields were as before, and the disks were more sharply outlined.

March 15th, there was slight concentric contraction of each field for white and red, the temporal pallor of the disks was well marked, and the retinal vessels were normal. Vision was still improving. With the correction of his astigmatism the vision of the right eye was $\frac{20}{70}$ and of the left $\frac{20}{30}$ +. He read well with + 1.00 added.

The patient was not seen again.

This case, as said before, with the four other cases, completes the varieties of visual complications of disseminated spinal myelitis and shows that in over half the cases there is lateral hemianopia for one eye alone—a symptom which will be of considerable diagnostic value in the cases in which visual disturbances precede the spinal symptoms.

A CASE OF PERMANENT IMPAIRMENT OF VISION FOLLOWING GASTRO-INTESTINAL HEMORRHAGE.

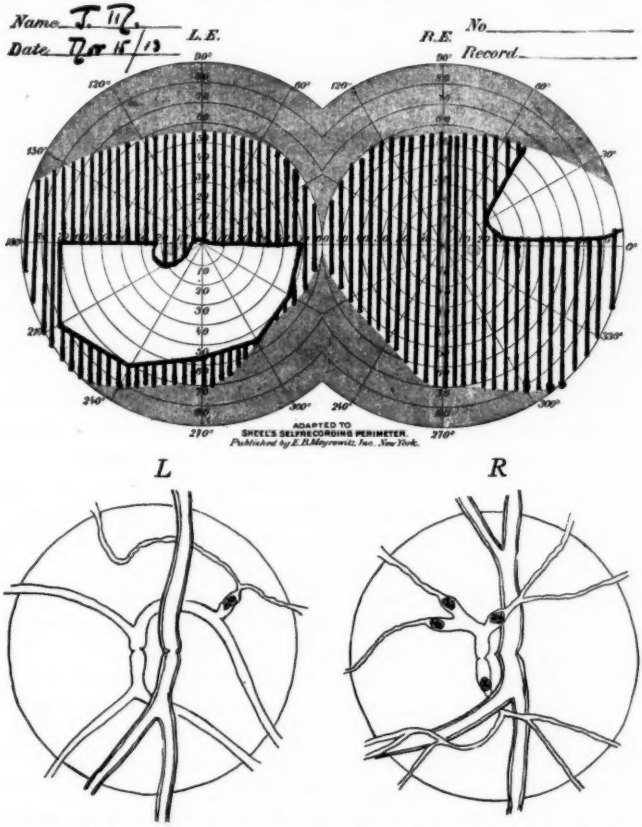
By Dr. GERALD H. GROUT, New York.

(With two figures in the text.)

IMPAIRMENT of vision following excessive loss of blood is a condition that is rarely met with. Up to 1901 only 198 cases had been reported. These were collected and carefully analyzed by Singer. Since then Zentmayer, in a similar manner, has added 24 cases, de Somonte, Ellet, Alt, Calhoun 1 case each, and Langenbeck 5. A study of the analyses of these cases shows that in about 70% the hemorrhage was from the uterus or gastro-intestinal tract. De Wecker and Knies as well as Wilbrand and Sänger, in the Franco-Prussian war, found no case where visual disturbances could be attributed to surgical hemorrhage alone. From this it would appear that there must be some underlying factor in addition to the loss of blood to produce amaurosis.

In the cases in which the visual field had been taken, various defects were found. In 20% of the cases there was a concentric contraction and in 10% a homonymous hemianopsia was present. The lower half of the field was lost in 23% and in 13% a central scotoma was found. Various explanations as to the cause of the defects in the field have been given, but no one theory will suffice to explain all cases. In the case that is to be reported here, the defect in the field can be explained by the fact that the arteries that supply the defective portion of the field are blocked. Probably, in like manner, the hemianopsia, which was present in some cases, may have been the result of a blocking of an artery in the optic radiations or region of the calcarine fissure.

Of the different theories that have been advanced to account for the pathological changes in the eye, that of Holden's, which is founded on animal experimentation, would explain the majority of cases. His conclusions were that the retinal ischæmia produced a degeneration of the ganglion cells.



Optic disks showing plugged arteries (semi-schematic), inverted image.

J. M., 66 years of age, a carpenter by trade, came to the Herman Knapp Hospital, November 15, 1913, for his defective vision. He gave a negative history up to two years ago. At that time, after having had severe abdominal pain, one

evening he vomited blood. This continued for three days and at the same time blood was passed at stools. The amount of blood lost can only be estimated; the patient believes it was several pints. The hemorrhage, however, must have been considerable, as the man experienced "air hunger" such as occurs in grave post-partum hemorrhage, and he was removed to the hospital in an exsanguinated condition. On the second day after his arrival in the hospital, he noticed he had lost his sight in parts of the field, and he states that his condition has remained the same until the present time.

Present Condition: The corrected vision in the right eye is $\frac{3}{200}$, in the left eye $\frac{15}{200}$. Of the visual field in the right eye there remains only a superior temporal sector. In the left eye the upper half of the field is wanting, the limits below being normal.

Ophthalmoscopic examination shows a diffuse pallor of the disks and blocking of several small retinal arteries; the blocking occurred near the margin of the disk at the point of second division of a retinal artery. Peripheral to the block the arteries are small and have greatly thickened walls. Near the disk can be seen a number of yellowish patches.

The explanation of this condition seems to be the cutting off of the blood supply to the retina, following severe hemorrhage. The ganglion cells of the retina, being sensitive, were the ones to suffer. Those that were supplied by the arteries that regained their normal condition survived; those supplied by the arteries that became plugged degenerated. In ordinary cases of this sort, only extreme anæmia is present, which may or may not cause degeneration of the ganglion cells; but in this case, there occurred permanent blocking of several smaller arteries from which resulted complete and permanent blindness of the portions of the field supplied by these vessels.

LITERATURE.

SINGER. *Beiträge zur Augenheilkunde*, 1902, vi.
ZENTMAYER. *Journal A. M. A.*, vol. lix., No. 12, Part 2.
DE SOMONTE. *Gac. med. d. Norte Bilboa*, 1909, xv., 86–90.
ELLET. *Ophth. Rec.*, 1910, xix., 1–5.
ALT. *Am. Journal Ophth.*, 1912, xxix., 74.
CALHOUN. *Ophth. Rec.*, 1913, xxii., 358.
LANGENBECK. *Graefe's Archiv für Ophth.*, Bd. lxxxvii., Heft 2.
HOLDEN. *Arch. für Augenheil.*, xl., 351.

REPORT OF THE SUCCESSFUL TREATMENT OF A CORNEAL TUMOR WITH RADIUM, WITH REMARKS ON RADIUM IN OPHTHALMOLOGY.

By ALBERT F. MATTICE, M.D.,

Clinical Assistant and Pathologist to the Herman Knapp Memorial Eye Hospital, New York.

(With two illustrations in the text.)

A GREAT deal is being written about radium at the present time, and though many extravagant statements regarding its curative power in cancer and other affections have been made, the metal and its compounds, nevertheless, have won a permanent place in our medical armament, and for certain affections, such as superficial epithelioma, radium is almost a specific.

As a remedial agent in eye affections, radium has not been very extensively used, and in fact the only systematic study in this connection, of which I am aware, was made by Prof. W. Koster of Leiden, Holland, who reported his investigations at the International Congress of Medicine held in London last summer. In this report, which is entitled, "On the Direct Treatment of Eye Diseases with Radium and Mesothorium," Koster gives a description of his technique in applying radium and mesothorium to the eye and then takes up in detail the results which he has obtained in the treatment of various ocular conditions.

Koster began his studies in 1905 and found himself practically a pioneer in the field, though he mentions Darier as first to recognize the value of radium in ophthalmology. Lawson and Mackenzie have also published favorable results in a few cases treated with radium; their work, however, as well as that

of Darier was confined to the anterior segment of the eyeball. Schindler cured xanthelasmata with 25*mgs* of radium bromide. Flemming had good results in the treatment of tumors with mesothorium, and also did some work on trachoma. None of these investigators, however, have made any systematic study of radium therapy in eye diseases, and it is to Koster that we owe our first detailed report on this subject.

In the present paper I shall review the work of Koster and also report a case of epithelioma of the cornea which was entirely cured by radium. This case came under my observation and care while house surgeon at the clinic of Professor Fuchs in Vienna, and was reported by me in the discussion of Professor Koster's paper before the ophthalmological section of the recent medical congress at London.

In his earlier experiments Koster used a small ebonite box closed on one side by a thin layer of mica and containing 5*mgs* of radium bromide which acted through the mica upon the tissue to be treated. Glass tubes were also used as containers for the radium.

During the last two years Koster has been substituting mesothorium-Knöffler (from Hellingenberg, Amsterdam) for radium bromide and finds it quite as satisfactory. Mesothorium is also more powerful than radium bromide as the radiant energy of 5*mgs* of the bromide is equal to only 2*mgs* of standard radium, while mesothorium is just as effective as equal quantities of the standard.

Koster has now discarded the ebonite box except in special cases and is using a small glass tube specially devised by him which contains either 5*mgs* of radium bromide or 4*mgs* of mesothorium. These new tubes are made of thermometer glass, are 4*cm* long, and have an inside diameter of 1*mm* and an outside thickness of 2*mm*. At one end of the tube is blown a small glass bulb somewhat less in diameter than the tube and with walls about $\frac{1}{10}$ to $\frac{1}{15}$*mm* thick. The radium bromide or mesothorium is passed through the tube into the glass bulb and the tube is then closed by a small pencil of cork pushed down to the opening of the bulb. By gently tapping the bulb while revolving it the radium salt can be spread out over its inner surface and is then

separated from the tissue to be treated by only the thin walls of glass. The open end of the tube is closed with a little sealing wax so that it can safely be placed in a disinfectant solution after using. When applying the glass tube to the eye by hand it is held by means of a thin metal tube into which the sealed end of the glass tube is inserted. Koster objects to fixing the radium tube or box in position with a plaster and so leaving it until the treatment is finished. He insists on a carefully conducted application by hand in which the tube is moved about over a given area in a systematic manner, being held either close to the tissues or in actual contact with them so that all portions are exposed to an equal amount of radiant action. As these applications usually last at least thirty minutes and often an hour, it is evident that they might become very tedious for one who had much of this work to do, and Koster mentions that members of the family or attendants can easily be trained to give the treatments.

Following are the results obtained by Koster in the treatment of various eye diseases with radium bromide and mesothorium. In presenting these results to readers of the ARCHIVES I wish to emphasize that the work is given entirely on its own merits and is not to be accepted without reserve any more than any other new investigation or research which awaits confirmation. Koster, however, is known as a very thorough, conservative, and conscientious worker, and the burden of proof rests with those who may not care to accept his results.

It is to be regretted, that he could not have been more precise in defining just what constituted the "improvement" which he mentions so often in a very general way as having been obtained in the treatment of various eye conditions with radium and mesothorium.

1. *Keratitis parenchymatosa.* (*a*) *Keratitis par. tuberculosa.* In these cases radium treatment and tuberculin may be given simultaneously. The lids are kept open either with the fingers or a speculum, and the glass tube with radium or mesothorium is held very close to the cornea, almost touching it, for thirty to sixty minutes, no anæsthetic being necessary. From five to ten treatments are given at intervals of three, five, or seven days, depending upon the amount of irritation caused

by the respective applications. A troublesome photophobia and marginal conjunctivitis may develop and appears sometimes several weeks after the last treatment, but is never serious. In fact, irritative reaction is usually very slight. If at the end of the first series of applications the tuberculous process is seen to be healing, no further radiation should be given. Should new eruptions, however, break out in other portions of the cornea, a second series of five sittings may be given after a month or so. According to the author results in these cases have been very favorable, and in many instances where other methods had failed entirely or given only temporary relief radium effected a complete cure.

In applying the radium or mesothorium tube to the cornea or conjunctiva, even when brought into direct contact with these tissues, an anæsthetic is seldom necessary, as the rays seem to have a numbing effect upon the nerve endings.

(*b*) *Keratitis par. scrofulosa.* The treatment of these cases is rendered more difficult by the marked photophobia and epiphora, yet the results are just as good as in the tuberculous forms and general treatment can be carried out at the same time.

(*c*) *Keratitis par. diffusa* (*luetica*). Here of course general luetic treatment either together with or previous to radiation is of prime importance. Radium or mesothorium applications given during general luetic treatment decidedly shortened the process of clearing in the cornea, and in cases where radiation alone was employed improvement was also noticed though not so marked as when general and special treatment together were given. Even in cases where the clearing process had evidently ended and the cornea remained opaque, repeated radiations at intervals of a week or fortnight, if kept up for a few months, generally caused marked improvement of vision.

2. *Nebulæ, Maculæ, and Leucomata Corneæ.* Before treating maculæ and nebulæ of the corneæ with radium a careful study of the thickness, density, and location, etc., of the opacity should be made in order to determine whether a partial clearing up of the cornea would materially help vision.

The tube is applied as in keratitis, with the bulb almost touching the cornea, and sittings of thirty minutes with a few days' interval are given. Although entire disappearance of a

macula was never seen, yet the transparence of these opacities was usually increased, their size diminished, and the corneal surface became smoother. Subjectively the patients noticed much improvement. The treatment of leucomata where the opacity is very dense is less satisfactory, yet much good can often be done with the 4*mg* mesothorium tube almost or actually touching the eye.

In one instance a man who was practically blind and had to be led by his wife could walk alone after a fortnight. Three months later he could read a newspaper and can still do so, several years after the first treatment. The case was one of double-sided leucoma caused by keratitis tuberculosa. In general, leucomata which consist mainly of fibrous tissue are not so susceptible to treatment as those which contain deposits of exudative material.

3. *Scleritis.* In scleritis of known etiology general treatment was given together with radiation. (In such cases it is difficult to see just how Koster estimated the separate effects of his general and special therapy.) Chronic tuberculous affections healed most rapidly, though favorable results were also secured with the more acute pustular confluent forms. Sittings of greater length and at shorter intervals than in keratitis should be given, the tube being brought into direct contact with the diseased part and moved smoothly over it. The conjunctiva is more immune to radio-activity than the skin, and it is best, therefore, to apply the tube under and not through the lids. If, however, an irritative reaction sets in treatment must be dropped at once. As in keratitis cocaine is not necessary, the rays apparently rendering the conjunctiva to a certain degree anæsthetic.

4. *Iritis and Iridocyclitis.* Here again general treatment is the first consideration and may be combined with radiation. In some cases, however, radium treatment seems to sensitize the conjunctiva to the action of iodides. Of the different forms of iritis the large acute, confluent, tuberculous nodule shows the least tendency to heal, especially if general bone, joint, or skin lesions be present. Improvement, however, is usually noticed, and in some cases large nodules which had effectively resisted other treatment disappeared entirely under radium therapy. The best results are obtained with

the chronic forms of tuberculous iritis nodosa. In these cases each treatment must last an hour, with intervals of two to seven days. No anæsthetic is necessary. The glass bulb is applied for thirty minutes to the ciliary region of the sclera even though no cyclitis be present, and then for thirty minutes over the diseased portion of the iris almost touching the cornea. Iridectomy should be postponed as long as possible, and in some cases synechiæ disappeared under treatment. A few patients complained of photophobia during applications and for a few days afterward.

This photophobia is usually noticed at about the fourth or fifth treatment and seems to be due to a radium reaction of the iris, but it disappears without damage to vision.

There is a form of so-called idiopathic iridocyclitis with marked photophobia and impairment of vision which appears in both eyes of women of about 50 and also sometimes at a much earlier age. This disease rarely yields to any of the ordinary modes of treatment. With radium, however, the photophobia disappears, the sight clears, and although destruction already accomplished cannot be repaired yet very often severe cases are brought to a satisfactory state of health. As a rule, five applications of an hour each must be made to each eye, and if necessary this may be followed after a few months by two to three more treatments. 25–50*mgs* of protoiodide of mercury *pro die* are given internally at the same time.

5. *Choroiditis and Myopia gravis.* These diseases, affections of the uvea and sclera, respectively, are also favorably influenced by the radium applications, and in every case where the ætiological or empirical treatment is unsatisfactory radium or mesothorium should be tried. The tube is passed under the eyelid and moved smoothly over the sclera from the ciliary body to the retrotarsal fold, pushing the bulb as far back as possible. After a few such movements the direction is changed, sweeping back and forth to the extreme right and left. In this manner the radium tube should cover all portions of the sclera which can be reached, both above and below the cornea. The tube is brought into direct contact with the sclera.

In the chronic forms of central choroiditis, especially with progressive myopia, the good effect was clear. As a general

rule, these patients are unwilling to submit to radiation unless there is much discomfort from metamorphopsia, photopsia, and central scotoma, and in any event it is not to be expected that perfect sight will be restored to these degenerated eyes. The results, however, are sometimes surprisingly good, the patients losing their distressing symptoms and being able to work again owing to increase of vision.

In a number of cases of diffuse choroiditis with a contracted field of vision, treatment widened the field and improved the patient's sight by clearing up the vitreous to a certain extent.

In the later stages, with degeneration of the retina and pigment alterations of the choroid, much change of course cannot be expected, but even here treatment has raised the vision somewhat, due as Koster thinks to improved circulation in the choriocapillaris and retinal vessels, making possible a better perception of light.

Localized tuberculosis of the choroid is also favorably influenced by radiation, provided the intraocular exudation is not too extensive and especially if the lesion is confined to the anterior segment of the eyeball and shows a tendency to affect the sclera.

In all the various forms of keratitis, scleritis, and uveitis precedence of course must be given to general and local measures based on the ætiology of the disease, and radium must be considered only as an adjunct to such therapy.

6. *Ablatio retinæ traumatica et post choroiditidem.* In traumatic detachment of the retina, radium, as might be expected, had absolutely no effect. In cases complicated with choroiditis the detachment itself was not affected, but when the detached area did not involve the macular region some improvement of central vision was often obtained, due to favorable influence on the choroiditic lesions. This improvement, though slight, usually encouraged the patients to have their second myopic or choroiditic eye treated, with very satisfying results.

7. *Retinitis pigmentosa, Chorioretinitis, and Hemeralopia congenita.* Koster treated ten cases of retinitis pigmentosa, two of which were not very far advanced. In these two earlier cases the mesothorium tube was applied to the sclera under the eyelids, five treatments of an hour each being given.

There seemed to be little difference in the hemeralopia and no change in the pigmentation. In five moderately severe cases there was no change either in the hemeralopia or in the central vision, save possibly a slight extension of the field. In three very bad cases where two had but little central vision with no field and the third was totally blind, treatment had only a doubtful effect. The first two patients developed some perception of light and movement in the lower portion of the field and complained of seeing a kind of glare or shining mist for about six months afterwards. This was evidently photopsia and it was hoped that an improvement might be setting in. A better function, however, was not obtained, though the optic disks became less pale and the retinal vessels more visible. Treatment in the tenth case was also unsuccessful. *Chorioretinitis* whether of luetic or unknown origin is helped by five to ten one-hour sittings, with intervals of a week or longer, the radium or mesothorium tube being applied directly to the sclera under the eyelids. In three such cases where the sight had been rapidly failing better central vision and a widened field were secured, the ring scotomata changing into partial ones. Here again any necessary mercurial or other treatment must not be neglected.

8. *Optic Nerve Atrophy.* Radium had no effect in these cases.

9. *Vitreous Opacities, Intraocular Hemorrhage, Retinal Hemorrhage.* Opacities of the vitreous due to choroiditis, chorioretinitis, and cyclitis were partially cleared up by radium applications and better vision obtained. The glass tube should be applied under the eyelids during three to five sittings of one hour each with intervals of a week. Resolution and absorption of hemorrhages which have taken place into the vitreous in cases of arteriosclerosis is also hastened by radium applied after bleeding has stopped and the treatment does not seem to favor a recurrence of the condition. The author also had one case of monthly recurring hemorrhage into the central portion of the retina which he thinks he helped with radium.

10. *Stationary and Progressive Cataract.* In the treatment of various forms of uveitis Koster was able to stop the progression of complicated cataracts which were present in a number of these cases. This is also observed, however, when the pri-

mary lesion has been cured by mercury or other treatment and does not necessarily have any significance.

The action of radium upon lens opacities themselves was nil, though in one case of cataract cærulea of star form in the anterior cortex the opacity fell to pieces and disappeared entirely after five sittings of one hour weekly, the tube being applied directly to the sclera.

In this case the mesothorium tube was used, and it must be remembered that in speaking of radium treatment no special distinction is made between radium and mesothorium, although Koster seems to prefer the latter, which in equal quantities is more powerful than radium bromide.

The cataracta cærulea above mentioned was complicated by hereditary chorioretinitis, and there was also a marked posterior polar cataract which, however, showed no change under treatment. A similar cataracta cærulea in the second eye also disappeared under radiation but more slowly.

It will be noted that in all the above conditions, such as keratitis, scleritis, iritis, choroiditis, etc., which Koster treated with radium, appropriate general treatment was also given when indicated, and for this reason it would seem very difficult to decide whether radium on the one hand or mercury and tuberculin, etc., on the other should be given the credit for any improvement obtained where a primary mixed treatment was employed. In the cases, however, where other treatment had failed and where radium alone was used or where radium caused an improvement when added to an already long-continued and ineffective therapy, then of course due credit must be given to the change in treatment.

11. *Angiomata of the Lids and Orbit.* In treating these growths in the orbit or on the conjunctiva five to ten hours' application for every square centimeter of surface is usually necessary for a cure, the glass tube being moved to and fro over the growth and pushed into it. The results are very good. If an angioma of the lids is being treated the sittings are shorter, one hour for every square centimeter of growth, applications being made every third day until a reaction, which is usually noticed after three to four sittings, appears. As a result of this reaction a crust is formed over the surface of the tumor and no further treatment should be given until it falls off.

12. *Nævus pigmentosus.* The glass tube is applied to the growth one hour for every square centimeter at intervals of a few days until the reaction is marked and a thick crust has formed. As soon as the crust has dropped off, the applications should be repeated until the growth has entirely disappeared. If treatment be stopped too soon the tumor may reappear, together with the pigmentation and hair growth.

13. *Xanthelasma palpebrarum.* The same rules apply here as in nævus pigmentosus, and a number of cases in younger people where treatment had not been neglected too long healed beautifully.

14. *Verrucæ.* Treatment as above should be pushed until a thick crust has formed, otherwise the wart may reappear.

15. *Lupus and Tuberculous Ulcers of the Eyelids.* Sittings of one hour for every square centimeter at intervals of three to seven days are given. On account of the hyperæmic condition of the lesions it is often hard to know when a reaction has been obtained, but a series of three to four sittings as a rule must be interrupted by a pause of three to four weeks. In general radium hastened the healing process, but in cases of long standing where the skin has been destroyed over a large area repair is often very tedious.

16. *Ulcus rodens palpebræ* (*Epithelioma*). Since beginning his experiments Koster has always had success with these malignant growths, though at first he did not treat them strongly enough. He never uses radium or mesothorium plasters, as advocated by some, but prefers the glass tube and ebonite box.

Every square centimeter of the tumor should get ten hours' application of 4*mgs* of mesothorium or its equivalent in radium, and sittings of one hour each with intervals of a few days are given. Under this treatment enormous growths and ulcers on both eyes were completely cured, even in very old people, leaving scarcely a scar.

Koster has not had sufficient experience with intraocular tumors to arrive at any definite conclusions, though Flemming has reported a case of intraocular sarcoma where he obtained some improvement by applying a mesothorium plaster to the eye.

17. *Neuralgia of the Trigeminal Nerve.* In a number of

cases of obscure origin where ordinary treatment had failed relief was afforded by mesothorium. Two 4*mg* boxes and one 4*mg* glass tube of the metal were used, one box and the tube being kept moving over the affected portion of the nerve's distribution, while the other box was applied for fifteen minutes at a time to various hyperæsthetic spots.

18. *Blepharospasmus, Tic convulsif.* If after a careful study of the ætiology no cause for the condition can be found, radium should be tried. A marked improvement was obtained in one case of forty-five years' standing, where secondary alterations in the affected half of the face were very evident. Sittings of one hour each were given, the little box being held for a few minutes over each of the chief branches of the facial nerve and the glass tube moved at the same time over the affected muscles. (Here again one is left in doubt as to just what the nature of the improvement was.)

19. *Ephelides.* Koster noticed, while treating a lady for xanthelasma, that the very marked freckles which were present all over her face were strongly bleached by the radium applications. After treatment applied directly to the freckles nearly all the pigment disappeared, and the good effect could still be noticed even after a summer's exposure to the hot sun.

20. *Conjunctivitis, Actinomycosis, Blennorrhea sacci lacrimalis, Dacryocystitis.* The author's experience with these cases is limited as he has always preferred to stick to known methods of treatment when satisfactory.

Two cases of chronic purulent conjunctivitis of unknown origin were treated, however, the glass tube being applied to the conjunctiva of the tarsus and fornix and a cure was obtained. Another case of chronic conjunctivitis had persisted for years and had resisted every known kind of lotion and ointment. After two sittings of one hour each a small hard swelling which had been present in the upper lid became soft and its contents could be expressed from the upper canaliculus. Microscopical examination proved the case to be one of actinomycosis. Combined radium and iodide treatment then completed the cure. Here the radium was of chief use in making the diagnosis.

In blennorrhea of the lacrimal sac and dacryocystitis with fistula, where tuberculosis is usually the cause, radium has

been applied with success. The glass bulb is passed through the dilated fistula or slit canaliculus into the dilated lacrimal sac and left there for an hour.

At the conclusion of his report Koster states that it may seem absurd to any one unacquainted with the action of radium rays that such a variety of diseases could be so favorably influenced by one remedy. He thinks that radium rays not only have the power to destroy tumor cells but when properly applied may also render normal tissues less susceptible to infection and tumor growth.

Having called attention to the work of Koster in the direct treatment of eye diseases with radium and mesothorium I now wish to present a case of epithelioma of the cornea which I saw completely cured by radium. This case was seen by me while in charge of a ward directed by Prof. Joseph Meller at the clinic of Hofrat Fuchs in Vienna, and I had an opportunity not only to observe the patient's condition from day to day but also to give a portion of the treatment myself. As far as I am aware there is no similar case in the literature, and Professor Koster himself told me at London last summer that he had had no experience with such a condition.

The patient, Pius Weiss, a man of 53, was admitted to the II Augenklinik in Vienna, complaining that a wartlike growth had destroyed the sight of his right eye. With a view to accident insurance the patient tried to connect this growth with a slight mortar burn which the eye had received four years previously. It is highly improbable, however, that this injury had anything to do with the development of the tumor.

ANAMNESIS. About three and a half years before admission, according to the patient's story, and about six months after the alleged mortar burn, a little white "pimple" was noticed at the lower corneal margin of the right eye. This "pimple" became gradually larger and spread over the surface of the cornea.

Six months later the eye, previously quiet, became violently injected and the growth became gradually larger until the right eye was finally blind. The gradual development of the tumor was accompanied by violent headaches and burning pain in the affected eye. On admission to the hospital the patient's condition was as follows:

STATUS PRÆSENS. Lymph glands in general normal. No preauricular swelling. Heart and lungs normal. Lids and

adnexæ normal. Tear sac normal. The conjunctiva of the right eye in general was much injected and from the periphery large tortuous veins extended towards the lower limbus where the following changes were observed:

Inferior temporal and inferior nasal as shown in the accompanying diagrammatic sketch No. 1. were two flesh-colored granulation-like masses sitting partly in the bulbar conjunctiva and partly in the cornea. The measurements of these two masses were as follows: Mass *a* (inferior nasal): horizontal diameter 13*mm*, vertical diameter 12*mm*, height about 3*mm*. Mass *b* (inferior temporal): horizontal diameter 10*mm*, vertical diameter 6.5*mm*, height about 2*mm*.

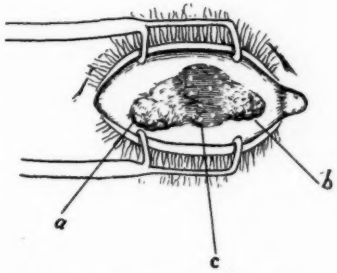


FIG. 1. Right eye before radium treatment.

a. Larger tumor mass inf. temp., sitting partly in the conjunctiva and partly in the cornea.

b. Smaller tumor mass, inf. nasal, partly conjunctival, partly corneal. Both tumor masses merge gradually into *c*, a thick pannus-like tissue which covers the cornea between the two masses and contains chalk deposits and a multitude of fine blood-vessels. Iris and pupil invisible. Vision: Light perception at twenty feet.

From the two tumor masses fine tentacle-like projections ran out into the conjunctiva along the swollen veins, and the cornea between the two masses was covered by a thick pannus-like tissue containing fine chalk deposits and a multitude of delicate superficial vessels.

The corneal sides of the two masses sloped gradually into the pannus-like tissue, while the conjunctival sides fell off more steeply and were fairly sharply delimited.

Vision: Left eye, normal; right eye, light perception at twenty feet, projection uncertain. Tension — 1.

A provisional diagnosis of epithelioma of the cornea was confirmed by both Professor Meller and Hofrat Fuchs, who considered the condition hopeless as far as the sight of the eye was concerned, and grave as regards the life of the patient unless further development of the growth could be checked. The patient objected to surgical interference, and as the tumor was fairly sharply delimited and entirely superficial it was decided to apply radium before insisting upon operation.

Radium as generally used in the Vienna clinics is the barium carbonate salt, a brownish powder having the formula $RaBaCo_3$, and it is usually applied in a little square or quadrangular-shaped box with a mica cover and a convenient handle.

In the case here described the eye was first cocainized, and then the *5mg* box of $RaBaCo_3$ was applied in turn to each of the two tumor masses, each mass receiving six minutes' radiation.

In making these applications the mica cover was placed directly upon the tumor mass and held there by hand for six minutes. Owing to the size of the larger tumor it was impossible to cover its whole surface at one time with the *1cm* square radium box, so that two separate applications of six minutes each to the upper and lower halves were necessary. In this way the extensions into the neighboring conjunctiva were also subjected to the radiant action. The lids were held open by a speculum.

No immediate result of the first treatment was apparent, and the patient complained of no discomfort during the application. The first change noted was a rather intense injection of the whole eye which appeared the next day, accompanied by some pain. This injection gradually increased until on the third day the conjunctival vessels around the tumor masses and in the pannus-like tissue covering the cornea were very much swollen. Measurements taken at this time showed the two masses slightly reduced in size. One week after the first application a second similar one of twelve minutes each was made to the two growths. On the next day a marked conjunctival injection had appeared, accompanied as before by some pain, which at times seemed fairly considerable. On the fourth day the eye had become intensely injected and the two tumor masses as well as the intermediate growth covering the cornea were seen to be covered by a thin whitish membrane which by the following day had become a thick pseudomembrane. Pain was intense in the affected eye. This condition persisted for a few days and then began to ameliorate, the injection diminishing and the membrane commencing to peel off. Two weeks after this second application the eye was only moderately injected, the membrane had disintegrated into shreds, and the two tumor masses had shrunk to mere remnants of their former size. In fact as one watched the eye from day to day the growth seemed actually to melt away, the cornea became gradually clearer in its lower half, and finally at this time, two weeks after the second application and only three weeks from the time of beginning treatment, the iris was already visible,

shimmering indistinctly through the clearing cornea. The patient could now distinguish hand movements. The clearing gradually progressed and an examination made five weeks after the first application showed the condition seen in Fig. 2.

The two tumor masses were now represented by two small remnants, *a* and *b*; the whitish pseudomembrane had entirely disappeared and the cornea, save for a small triangular-shaped area just nasal from *b*, was fairly clear though covered by a very thin transparent pannus-like membrane containing many fine vessels. The cornea seemed to bulge somewhat and the anterior chamber appeared a little deeper than normal. The pupil was wide (atropine) and the iris apparently normal.

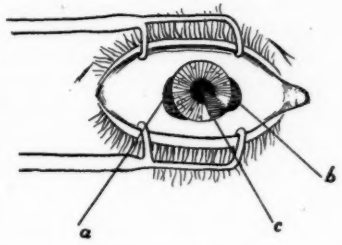


FIG. 2. Right eye five weeks later, after two applications of radium.

a and *b*. Remnants of tumor masses shown in Fig. 1.

c. Triangular-shaped remnant of the thick pannus-like tissue which formerly covered the cornea. Iris and pupil now plainly visible. Superficial vessels and a thin transparent membrane still present on the cornea. 3½ months later only a few maculæ remained in the cornea, the tumor masses had entirely disappeared, and the vision was $\frac{20}{70}$. Three applications of radium, 6–12–12 minutes each, were made.

Six weeks after beginning treatment the third and last application was given, each tumor remnant getting fifteen minutes' radiation. A week later the patient was discharged, the condition not having changed materially since last noted. The vision at this time was fingers at 1 meter. Three months after dismissal the patient returned to the clinic for further observation and aside from a few maculæ and superficial vessels in the cornea no trace of the tumor was to be seen. The man who had come into the clinic some five months previously, blind in one eye and with an apparently hopeless prognosis, now had a vision of $\frac{20}{70}$. Up to the present time, as far as I am aware, there has been no recurrence of the condition.

There is of course opportunity for criticism of the diagnosis epithelioma of the cornea in this case on two grounds: first,

that no specimens of the growth were secured for pathological examination and, second, that the growth did not originate in the cornea, according to the history of the patient. Owing to objections by the patient to surgical interference no specimens for microscopic examination could be secured, but both Professor Meller and Hofrat Fuchs, who have had a large experience with ocular tumors, considered the case absolutely typical, and there can be no reasonable doubt that it was really an epithelioma which was cured by radium. The burden of proof rests with those who would attempt to show that it was not an epithelioma. As to whether it was one of those rarer tumors developing in the corneal parenchyma itself and invading the conjunctiva secondarily, or *vice versa*, is of no moment. For all practical purposes it was an epithelioma of the cornea, though from the history of the case it was very probably one of the commoner types, which originate in the conjunctiva and invade the cornea secondarily.

The fact of absorbing interest is that a new growth which had invaded the cornea and destroyed sight was completely and apparently permanently cured by radium, with partial restoration of vision.

It will be noticed that the time of application of the radium, six to twelve and fifteen minutes, as used in my case, was much shorter than the thirty- and sixty-minute periods advised by Koster. Perhaps his preparations are weaker than those used at Vienna, but it is certain that sixty-minute applications of the 5*mg* box of $RaBaCo_3$, judging from the reaction obtained in six minutes, would have been dangerous to the eye. It would therefore seem absolutely necessary that each clinician carefully test the strength of his own particular brand of radium before proceeding to any very extensive investigation in ophthalmology.

The work of Koster along this line, though rather indefinite in many respects, at least as presented in his report, is nevertheless a distinct advance in ocular therapy and should either be confirmed or disproved. In carrying out such work in America, however, one is greatly handicapped by the difficulty of obtaining enough radium to make any satisfactory tests. The metal is listed at $120,000 per gram and a 5*mg* box would cost $600. Every bit of the precious metal is jealously guarded

and seldom allowed to leave its owner's hands. Even in our greatest hospitals it is a rarity and a luxury. Meanwhile our native radium-bearing ores are being exported to foreign countries, and the finished product is resold to us at prohibitive prices. Germany, Austria, Holland, and other countries, however, are industriously conserving and developing their own ores, and it is only in these countries that anything like a systematic radium treatment of cancer or other conditions is possible. At the general hospital in Vienna, for example, there is a central supply station where radium boxes in ten different sizes are available. At the eye clinic of Professor Fuchs we never had any trouble in getting radium when needed. It was merely signed for by a responsible member of the staff who had to return it within a limited time. The present campaign which is being conducted by Dr. Howard A. Kelly of Baltimore and others to secure conservation and development of our own radium-bearing ores is a step in the right direction, and it is sincerely to be hoped that in the not too distant future our large general and special hospitals in America may find enough of the metal at their disposal to carry out much-needed treatment and investigation.

In conclusion it is a pleasure to thank Hofrat Fuchs for his kindness in permitting me to publish the above case and also Professor Meller and Dr. Joseph Keller for courtesies extended me in connection with the same.

ANATOMIC STUDY OF A CASE OF TEMPORAL CONUS (COLOBOMA) IN AN HYPEROPIC EYE.[1]

By E. V. L. BROWN, M.D., Chicago.

(With one illustration on Text-Plate V.)

THE conus or crescent of myopia is due to an increase in the length of the eyeball. The chorioidea is torn from the margin of the disk, the pigment epithelium atrophies, and the crescent of sclera is laid bare. On the other hand, the conus of hypermetropic and emmetropic eyes is a congenital defect, in reality often a coloboma, and so more allied to conus down-and-in. While recent studies have added much to our knowledge of these allied conditions, there is only one anatomic report extant of a temporal conus in a non-myopic eye—that of Elschnig in 1900.[2]

An eye showing this condition was given to me for study by Professor Fuchs during a sojourn in his clinic some years ago, and with his kind permission I present the report herewith:

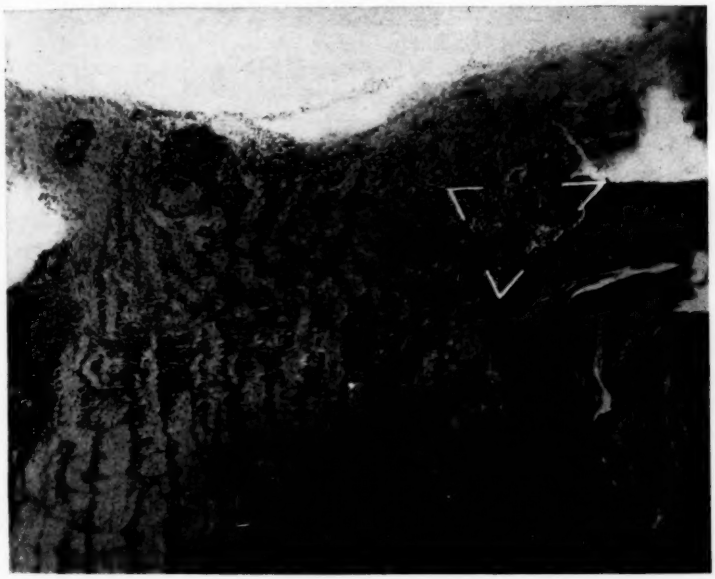
Female, age 53. The left eye had been injured by a piece of wire five days before. Examination showed a perforating wound of the temporal limbus, a dull cornea, and a *2mm* high hypopyon. The pupil was dislocated toward the wound and the anterior cortex of the lens was opaque. The tension was normal and vision reduced to the perception of light. R. V. $\frac{4}{5}$; condition of the fundus not mentioned.

Microscopic examination reveals a penetrating wound of the limbus and adjacent lens equator with prolapse and incarceration of a considerable sector of the iris. This had been followed by a marked suppurative endophthalmitis and some increase of intraocular tension. Pus cells and

[1] Read before the Chicago Ophthalmological Society, October 20, 1913.

[2] Elschnig: *Arch. f. Ophth.*, Bd. 51, pp. 391–430; Case III., p. 405.

ILLUSTRATING DR. E. V. L. BROWN'S ARTICLE ON "ANATOMIC STUDY OF A CASE OF TEMPORAL CONUS (COLOBOMA) IN AN HYPEROPIC EYE."



Temporal Coloboma of the Chorioidea and Sclera in an Hyperopic Eye.

fibrin half fill the anterior and posterior chambers, invade the temporal equator and back half of the lens, extend across the fossa patellaris from ora to ora, infiltrate the inner layers of the retina, skirt its inner surface in a broad band as far as the disk, and fill out the physiologic excavation and produce a mild optic neuritis. Only the anterior and posterior ends of the chorioidea are infiltrated; the body of the vitreous is permeated with fibrin, and masses of pus cells form a small abscess near the ora serrata on the temporal side. The iris, corona and orbiculus ciliaris, lens and vitreous bounding the posterior chambers, on the side of the wound, are markedly infiltrated with pus cells; the other side is quite free.

Secondary glaucoma was present, for the sinus angle is completely closed on one side and narrow on the other side, and a broad synechia binds the pupillary third of the iris to the lens; the outer layers of the corneal epithelium are keratosed, the inner ones stilted as if œdematous; the ciliary epithelium hydropsical. The canals of Schlemm are for the most part open, the spaces of the trabeculum corneosclerale moderately filled with pus cells.

The "entrance canal of the optic nerve" is normal in form, course, and width.[1] Its direction is "temporally oblique," *i. e.*, the center of its inner opening (the foramen lamina vitrea chorioideæ) lies temporal to the center of its outer opening (the level of the outer surface of the lamina cribrosa). The obliquity is slight—12°.[2] The inner opening measures 1.5*mm* in width and the outer 1.6*mm*.[3] The

---

[1] Salzmann: *The Anatomy and Histology of the Human Eyeball*, pp. 95–97. Chicago Medical Book Co., 1912.

[2] Marked obliquity is characteristic of myopic eyes, but may be found in emmetropic eyes "with strikingly long optic axes." (Salzmann.)

[3] This is a very narrow scleral foramen, in the absolute, but the chorioideal foramen is so much widened by the conus on the temporal side that it may not be so narrow, relatively. Elschnig makes this relationship between the width of the two foramina the basis of a classification of the disk into four types. In Type I there is a relatively narrow entrance canal, with little supporting and connective tissue. The nerve bundles lie close together and there is no physiologic excavation. Types II and III lead up to IV. Here there is a wide entrance canal, the nerve bundles are separated by a large amount of tissue, and a maximum of lamina cribrosa is exposed in the bottom of a large physiologic cup.

In our case axial sections show only a small temporal funnel-form excavation. The floor is on the level of the anterior surface of the chorioidea.

(See Elschnig: "Der normale Sehnerveintritt des menschlichen Auges, klinische und anatomische Untersuchungen." Denkschrift der kaiserlichen

nasal wall is straight like the side of a cylinder, the temporal wall curves toward the optic axis like the side of a cone. As usual in temporally oblique canals, the "border tissue" separating the nerve from the sclera is much better developed on the temporal than on the nasal side.

The Conus.

A defect in the structure of the chorioidea, constituting a "conus," is found at the temporal margin of the optic-nerve head. It extends from the upper third to the lowest level of the disk. Instead of coming flush up to the side of the nerve head, the chorioidea here ends a considerable distance temporal to it. The various layers of the stroma do not taper off gradually but end abruptly on a line perpendicular to the surface. The lamina vitrea extends a fraction of a millimeter (0.09) farther toward the disk.

The greatest width of the conus (0.46*mm*) is found twenty sections below the level of the central vessels and the fovea (about ½ millimeter below the horizontal meridian). The widest portion of the disk exposed to ophthalmoscopic view would therefore lie between the end of the nasal pigment epithelium and the temporal margin of the entrance canal at the level of the anterior surface of the lamina cribrosa; in central sections this line measures 1.38*mm* in width and since the conus measures 0.46*mm* it would have ⅓ the width of the disk, ophthalmoscopically.

The sclera is also defective in this situation. Instead of continuing forward along the lamina cribrosa and forming a side or boundary for the anterior half of the entrance canal, the scleral surface shelves off obliquely forward and outward at an angle of 45° to the end of the chorioidea. This scleral surface is turned forward and axially toward the center of the disk instead of directly axial. The defective area is triangular in shape, each side measuring about half a millimeter (see plate).

The defect between the end of the chorioidea and the disk is filled out by a portion of the retina. This comprises the two nuclear layers and possibly the intervening plexiform layer. Instead of stopping at the disk, a duplicate or fold of redundant retina curves backward along the nerve-fiber bundles of the disk, dips down into the conus as far as the inner surface of the sclera, then curves outward and upward along the end of the chorioidea, completing three-

Akademie der Wissenschaft (1900), and *Encyklopedie der Augenheilkunde*, "Excavation, physiologische," p. 292. Edited by O. Schwarz. (F. C. W. Vogel, Leipzig, 1904.)

quarters of a circle, continues up over the end of the lamina vitrea, almost touches the outer nuclear layer again, and finally ends where the pigment epithelium stops. The duplicature is of disk shape and about one millimeter in diameter. In its center the outer nuclear layers are in apposition. The rod-and-cone layer ceases opposite the pigment epithelium. The nerve-fiber layer goes over onto the disk in a normal manner. No nerve-fibers or ganglion cells can be followed into the duplicature. The defect in the sclera behind the duplicature is about half filled out by the "intermediary tissue of Kuhnt" which normally forms a part of the ophthalmoscopic scleral ring.

Neither at the level of the conus nor elsewhere does the sclera show any ectasia. The outer layers are compact and well developed. The union of the dural sheath and sclera is firm on the temporal side, quite loose on the nasal side. The nasal end of the intervaginal space is triangular in form; the portion just external to it is collapsed, as usual after enucleation. On the temporal side the space is reduced to a narrow slit filled with arachnoidea.

The thickness of the sclera and chorioidea in various locations is shown in the following table:

	At the fornix in front of the end of the intervaginal space.		Opposite the insertion of the dura into the sclera.		1*cm* ant. to the margin of the disk.		2*cm* ant. to the margin of the disk.	
	Nasal	Temporal	Nasal	Temporal	Nasal	Temporal	Nasal	Temporal
Sclera	0.38	0.23	1.1	1.09	0.54	0.50	0.36	0.23*mm*
Chorioidea	0.10	0.13	0.08	0.06	0.06	0.08	0.05	0.044*mm*

The greatest breadth of the dural sheath nasally is 0.8*mm*, temporally 0.8*mm*. The bulb measures 23*mm* from the center of the cornea to the back surface of the sclera at the posterior pole. The length of the curve along the outer surface of the sclera from the limbus to the dural sheath is 23*mm* on the nasal side and 30*mm* on the temporal side.

SUMMARY

The essentials of the entire finding consist of a crescentic defect in the pigment epithelium, the chorioidea, and the inner layers of the sclera along the temporal border of the disk. Almost the entire defect is bridged over and filled out by a fold or a duplicature of the retina. This is a direct continua-

tion of the two nuclear layers. The nerve fibers do not dip back into the conus at all, but go directly over into the nerve head in the usual way. Although the anterior layers of the sclera are absent over the floor of the conus, *the sclera is nowhere ectatic*, either behind the conus or elsewhere. The eye has an axial length of *23mm* only, and is therefore of the hypermetropic type.

As stated above, the only other case in the literature is that reported by Elschnig. In an article on "Coloboma of the Optic Nerve Entrance and Conus Below," he describes a conus or coloboma of the retina, chorioidea, and nerve-entrance structures along the entire temporal and the lower edge of the disk. The chorioidea and retina proper stopped a considerable distance from the temporal edge of the disk. The defect was filled out by rudimentary retinal tissue containing ganglion cells and nerve fibers. In the center of the conus there was also a defect of the sclera and of the dural sheath at the margin of the nerve head. The cavity or recess thus completely separated the end of the sclera and outer layers of the dura from the inner layers of the dura and the pia ensheathing the temporal side of the nerve trunk. Into this pocket the rudimentary nerve tissue continued nearly to the depth of the posterior scleral surface opposite the fornix of the intervaginal space. It then remounted to the edge of the disk. Above and below this level there was no coloboma of the sclera and sheaths, only a conus or coloboma of the chorioidea, and this was likewise filled out by rudimentary retina. The nasal border of the disk showed two similar pockets; here the retinal tissue was connected with the disk but not with the retina proper. No ectasia of the sclera was present. The case is called "temporal coloboma of the optic nerve entrance," etc.

Anatomically, there is no essential difference between Elschnig's case and my own, although in his case all the layers of the retina[1] were found in the defect and in mine only the outer layers. In neither case was there any ectasia of the sclera, and in neither any evidence of inflammatory products or fetal mesodermal bands to interfere with the development of

[1] *I. e.*, elements representing both the pigment epithelium and the retina proper.

the retina, as described by v. Hippel in cases of typical coloboma. The coloboma involved the sclera as well as the chorioidea in both. Neither were myopic eyes; in Elschnig's case emmetropia was established clinically, in mine the axial length of *23mm* practically rules out myopia even when due allowance is made for shrinking in fixation and hardening. Nasal supertraction was not present.

Atypical colobomata of the sheaths, sclera, and chorioidea in other directions, above or nasal to the optic nerve-entrance, have been described by Bach,[1] Goerlitz,[2] Manz,[3] Bock,[4] and Elschnig.[5] Elschnig explains all these atypical as well as the typical colobomata by the assumption of an active proliferation of one or both layers of the secondary optic vesicle before the mesoderm of the chorioidea, sclera, and nerve sheaths has been formed. The redundant ectoderm then obstructs the development of these layers in the colobomatous area. He rejects the old rotation of Vossius.[6] This presumed a rotation of the chorioideal cleft about the optic axis from its normal position, down and in, to one of the atypical positions—out, up, or in. He also rejects the Deutschmann inflammatory theory—obstruction of union by new-formed connective-tissue strands.

Seefelder[7] accepts Elschnig's explanation as adequate for atypical colobomata, but insists that abnormally persistent mesodermal structures may well give the first impetus to

---

[1] Bach, L.: "Pathologisch-Anatomische Studien ueber verschiedene Missbildungen des Auges," *Arch. f. Ophth.*, Bd. 45, Heft 1, Case V., p. 15, 1898.

[2] Goerlitz: "Anatomische Untersuchung eines sogenannten Colobomanervi optici," *Arch. f. Augenh'lk'de*, Bd. 85, pp. 219–259, 1897.

[3] Manz: "Ueber das angeborene Colobom des Sehnerven," *Arch. f. Augenh'lk'de*, Bd. 23, pp. 1–18 (see p. 4), 1891.

[4] Bock, E.: "Das angeborene Colobom des Sehnerven." Wien, 1893.

[5] Elschnig: "Das Colobom am Sehnerveneintritte und der Conus nach unten," *Arch. f. Ophth.*, Bd. 51, Heft 3, Cases I.–V., 1900.

[6] Vossius: "Beitrag zur Lehre von den angeborenen Conis," *Klin. Monatsbl. f. Augenh'lk'de*, xxiii., pp. 137–157, 1885. This theory has again been espoused by Keil (Anat. Hefte, Bd. 32, 1906) upon the basis of findings in pigs' eyes. Seefelder remarks that his data are inconclusive (*Arch. f. Ophth.*, 58, p. 331).

[7] Seefelder: "Pathologisch-Anatomische Beitraege zur Kenntnisse des angeborenen Coloboms des Auges," *Arch. f. Ophth.*, Bd. 68, 2, pp. 275–353, 1908.

proliferation of the retina. Once this abnormal direction is established, a planless and abundant overgrowth results. Another explanation must, however, be found for typical colobomata, for here it is apparently a simple failure of the posterior end of the fetal cleft to close. Seefelder says excessive proliferation of the margins of the secondary optic vesicle is not usually found, yet he calls attention to the case of Van Duyse[1] in which a deposition of retina lay in a pocket-like cavity in the chorioidea.

Tertsch[2] also accepts Elschnig's theory as, in general, the best explanation for cases of atypical conus. His case of inferior conus throws much light upon the pathogenesis of atypical colobomata. The inner and outer nuclear layers of the retina were fused together some ¼ P. D. below the disk. The pigment epithelium reached on about ½ the remaining distance to the disk, then turned sharply forward toward the vitreous and doubled back upon itself (making two layers of pigment epithelium) and joined the fused nuclear layers at the end of the retina.[3] The chorioidea between the end of the pigment epithelium and the disk was reduced to a thin layer of tissue, but the sclera was nowhere thinned or ectatic. The case would be considered a conus, clinically, rather than a coloboma, but the anatomic findings show it to be a coloboma. There is, therefore, no sharp line between a "conus" with no change in the level of the defect, and a "coloboma" with hollowing out of the sclera. The six cases in the literature similar to Tertsch's were all complicated by thinning or actual ectasia of the sclera. In his case alone the formation cannot be ascribed to stretching and tearing of the chorioidea and retina from the disk. He considers it to be due to an obstruction to the closure of the fetal cleft, combined with a folding back of the pigment epithelium at the border of the secondary optic

[1] Van Duyse: "Contribution à l'étude des colobomas de l'œil," *Arch. d'opht.*, tome xvi., 1896.

[2] Tertsch: "Der Conus in atypischer Richtung," *Arch. f. Ophth.*, Bd. 84, pp. 530–553, 1913.

[3] Salzmann gives two possible explanations of such a finding: one is a "shifting of the point of differentiation" between the retina and the pigment epithelium, and the other, an actual mechanical displacement or ectropium of the inner layer (in Tertsch's case of the outer layer). *Arch. f. Ophth.*, Bd. 39, Heft 4, p. 139, 1893.

vesicle, probably induced by abnormally persistent mesodermal elements. He adds that a widening of the conus may have been effected by a slight increase in the surface expanse of the sclera from actual overgrowth of it.

A possible relationship between the atypical coloboma and the fetal cleft is suggested by the finding of atypically placed, multiple indentations of the anterior margins of the secondary optic vesicle. These have been described in both lower animals and man by Van Duyse,[1] Szily,[2] and Wolfrum,[3] and most recently by Seefelder in the article quoted above. As Szily notes, however, the indentations never extend behind the equator and probably can only be used to explain atypical colobomata of the anterior segment of the bulb.

CONCLUSIONS

Elschnig's theory of excessive proliferation of the margins of the secondary optic vesicle and subsequent interference with the development of the chorioidea and sclera and sheaths offers the best explanation of the cases of atypical coloboma (or conus) of the optic-nerve entrance heretofore reported and of the findings in the case presented herewith. This only carries the problem one step farther into the realm of speculation, for it does not explain why the excessive proliferation occurs.

It is a pleasant duty to here express my obligation to Professor Fuchs for the privilege of studying and reporting this material from his clinic, and to thank him for his kindly assistance in the study of the same.

EXPLANATION OF PLATE FIGURE.

The position and extent of the colobomatous defect in the chorioidea and sclera and the fold of retina lying in it are shown by the triangle outlined at the right hand (temporal side) of the optic-nerve head. Magnification 45 diameters.

---

[1] Van Duyse: "Eléments d'embryologie et de tératologie de l'œil" in *Encyclopédie française d'ophtalmologie.* Octave Doin, Paris, 1904.

[2] Szily, A. v.: "Ein nach unten und innen gerichtetes, nicht mit der Foetalspalte zusammenhaengendes Kolobom der beiden Augenbecher, bei einem etwa 4 Wochen alten menschlichen Embryo," *K. M. f. A.*, 45 (Beilageheft), pp. 201–219, 1907.

[3] Wolfrum, C.: "Multiple Einkerbungen des Becherrandes der secondaeren Augenblase, ein Beitrag zur Kolobomfrage," *K. M. f. A.*, 46 (N. F. 6), pp. 27–33, 1908.

DEPARTMENT ON CONSERVATION OF VISION.

EDITED BY HENRY COPLEY GREENE, AND DR. GEORGE S. DERBY, BOSTON.

UP to the present time no consecutive effort has been made by ophthalmological journals to keep the profession informed as to the progress of the Conservation of Vision movement in various parts of the country and of the world at large.

It is open to doubt whether more than a few in our profession are conversant with the work that has been done in the past, with the present status of this movement, and with the various plans for the future evolved in different communities. Outside of those few who have given of their time and strength to conservation, it is safe to say that the average ophthalmologist knows something of that which is going on in his own community, but little of the progress or lack of progress elsewhere.

Some day it is probable that there will be an acknowledged central organization which will keep in touch with the work done in various States and which will publish from time to time useful information as it accumulates. Such an organization, if it exists to-day, is in its infancy.

To bring together, then, such information as is valuable, and to interest ophthalmologists in this movement, is the purpose of this department.

It is manifestly impossible in the space at our disposal to review in one issue the Conservation of Vision movement; moreover, a summary of the present status of the work in this country may already be found in an article[1] read at the last meeting of the American Medical Association and published in the *Transactions of the Section on Ophthalmology*, 1913.

[1] "Preventable Blindness—A Challenge to the Professions," by Henry Copley Greene.

As material presents itself, the situation in various States will be described. Special topics of interest will be taken up in relation to the country as a whole.

A list of organizations for the Conservation of Vision in this country is appended below.

New York.

The New York Association for the Blind was organized in 1905 and incorporated in 1906. In 1908 a Committee on the Prevention of Blindness was appointed from this Association, its object being to "ascertain the direct causes of preventable blindness and to take such measures in co-operation with the medical profession as shall lead to the elimination of such causes.

Although much valuable work has been done by this Committee, it was felt by its members that greater progress would be made were the pursuit of prevention taken up independently; and in the last few months a separate organization, with this Committee as a nucleus, has been formed for the prevention of blindness, known as the Committee on the Prevention of Blindness.

In 1913 the Legislature established a permanent State Commission for the Blind, which, through its secretary, has asked the Committee on Prevention for suggestions in regard to preventive work. In reply, request has been made that the Commission should obtain the following much needed and important information:

1. The present number of blind persons in the State of New York and the causes of blindness.
2. Such classification as will show what are deemed preventable causes.
3. The proportion of cases resulting from each preventable cause to the total number of blind persons in the State.

Through a legisiative grant, prophylactic outfits for the prevention of ophthalmia neonatorum are distributed free throughout the State, the appropriation for this purpose being $5000 in 1913.

A bill for the control of midwives is being drafted. In 1913 a rule was adopted by the Department of Health of New

York City requiring midwives to report cases of ophthalmia neonatorum.

Trachoma clinics have been established in New York City for the treatment of children in public schools.

A vigorous State and city campaign to regulate or eliminate the use of wood alcohol has been instituted, and the co-operation of the Brewers' Association secured.

The relation of illumination to the Conservation of Vision has been taken up by the Committee on Conservation, and the active co-operation of the Illuminating Engineering Society has been secured.

The Committee on Prevention has prepared an exhibit on the prevention of blindness. Various duplicates of this have been loaned throughout the State for exhibition purposes, while others have been sold to organizations in other States.

Work on the education of children with defective eyesight was recently started in New York City. The late Miss Bingham, Supervisor of Classes for the Blind in the Public Schools, included in these classes children with interstitial keratitis, dislocated lens, etc., whose vision was so low as to prevent their education in the usual way. Miss Bingham had studied the classes conducted in London under the guidance of Dr. N. Bishop Harman; and although her own work for children with defective eyesight was in its infancy, it gave and continues to give great promise for the future.

The Committee on Prevention has issued articles and leaflets on various aspects of conservation, trachoma, wood alcohol, midwives, ophthalmia neonatorum, and the like, and has waged a vigorous campaign through the newspapers.

KENTUCKY SOCIETY FOR THE PREVENTION OF BLINDNESS,
722 West Main Street, Lexington, Ky.,
Miss LINDA NEVILLE, *Executive Secretary.*

This is a State-wide society, whose secretary gives full time to its work. The secretary, Miss Neville, also manages the "mountain fund," which aids securing treatment for persons threatened with blindness. She makes frequent addresses on different phases of the work in courthouses, before college assemblies and classes, institutes of county school teachers,

women's clubs, and church societies. In the course of this work, she travels back and forth across the State many times during the year, both speaking to audiences and conferring with physicians about local conditions.

The need for work for special cases of persons threatened with blindness is acute, as may be seen from the following description of conditions.

"In a mountain hovel, consisting of two rooms, were found four families, existing in the most abject poverty. Among these was a man with only partial vision in one eye, the other being totally blind. One of his sons is totally blind. When this fellow was a small boy, he had trouble with his eyes, for which an old lady, acting as a doctor, put some very strong medicine in his eyes, causing him such excruciating pain that they had to hold him when she administered the evil stuff. He has not since been able to see. This fellow is led around by a younger brother, who himself can barely keep them from falling into the ditch together. The smaller boy leads him to town to find wood to saw and then sits about all day, while the older one feels his way with a one-man saw."

To combat such conditions as ignorance and disease, Dr. J. A. Stucky established the semi-annual eye clinic at Hindman, Ky., which is too well-known to require extensive mention here. A similar clinic is held by Dr. William Offutt at the hospital belonging to the Witherspoon College at Buckhorn, Perry County. To both of these clinics, as well as to the regular clinics in Lexington, etc., Miss Neville brings in patients from all parts of the State for treatment. She succeeds in getting a most active response from mountain people suffering from trachoma, one man being mentioned who sold all his pigs to pay his railway fare.

By direction of the Surgeon-General, Dr. J. H. Oakley, of the United States Public Health Service, is investigating the prevalence of trachoma among the school children in Jefferson County, and arrangements have been made to have relays of senior students from the medical school of the University accompany Dr. Oakley on his tours of inspection. And thus it will be possible not merely to exclude infected children from the public schools and secure treatment for them, but at the same time to familiarize the doctors of the future with this disease.

While trachoma is most conspicuous in work for the conservation of eyesight in Kentucky, ophthalmia neonatorum is also very important. At the City Hospital, Louisville, Ky., during the fiscal year 1912, thirteen cases of gonorrheal ophthalmia were treated with good results in six cases, fair results in three cases, and in four cases with result in blindness. To meet the situation which these figures indicate, the Kentucky Society for the Prevention of Blindness has drafted a bill for the control of ophthalmia neonatorum, based on the "model bill" of the American Medical Association. The Kentucky bill provides that not only midwives and physicians, but nurses, hospitals, etc., must immediately report all cases in which the symptoms of ophthalmia neonatorum appear within *thirty* days after birth. The bill provides for the free distribution of a prophylactic and where blindness results from ophthalmia neonatorum. It also provides for a fine of not more than $100 for failure to report.

The Society for the Prevention of Blindness has secured endorsements of this bill from the medical societies of Jefferson and Fayette Counties and from various commercial bodies. The bill was favorably reported in the Kentucky Senate, January 29, 1914, and is expected to pass the Legislature.

Organizations for the Care of the Blind and Prevention of Blindness.

Arkansas Society for the Prevention of Blindness,
Little Rock, Arkansas,
Mr. Guy V. Curan, *Secretary.*

California Society for the Prevention of Blindness,
2808 Derby St., Berkeley, California,
Newel Perry, Ph.D., *Secretary.*

Indiana Committee on Conservation of Vision of the Indiana State Medical Society,
Lafayette, Indiana,
George F. Keiper, M.D., *Secretary.*

Kentucky Society for the Prevention of Blindness,
722 West Main Street, Lexington, Ky.,
Miss Linda Neville, *Executive Secretary.*

MASSACHUSETTS COMMISSION FOR THE BLIND,
3 Park Street, Boston,
LUCY WRIGHT, *General Superintendent,*
HENRY COPLEY GREENE, *Agent for Prevention of Blindness.*

MISSOURI ASSOCIATION FOR THE BLIND,
609 Metropolitan Building, St. Louis, Mo.,
Miss CAROLINE W. BATES, *Secretary.*

NEW JERSEY COMMITTEE ON PREVENTION OF BLINDNESS,
40 Lloyd Road, Montclair, N. J.,
Mr. EDGAR S. WEIRS, *Secretary.*

NEW YORK STATE COMMISSION FOR THE BLIND,
105 West 40th St., New York,
CLARENCE H. ABBOTT, *Secretary.*

OHIO STATE COMMISSION FOR THE BLIND,
223 Fulton St., Columbus, Ohio,
CHARLES F. F. CAMPBELL, *Executive Secretary.*

COMMISSION ON THE CONSERVATION OF VISION OF THE MEDICAL SOCIETY OF THE STATE OF PENNSYLVANIA,
University Hospital, Philadelphia,
T. B. HOLLOWAY, M.D., *Secretary.*

WISCONSIN STATE ASSOCIATION FOR THE BLIND,
Administration Building, 10th and Prairie Sts., Milwaukee, Wis.,
Miss CARRIE B. LEVY, *Secretary.*

REPORT OF THE PROCEEDINGS OF THE SECTION ON OPHTHALMOLOGY OF THE NEW YORK ACADEMY OF MEDICINE.

By GEORGE H. BELL, M.D., Secretary.

MEETING OF JANUARY 19, 1914. HENRY H. TYSON, M.D., CHAIRMAN.

Dr. Lewis W. Crigler presented a patient with **binocular ophthalmoplegia externa.** James A., aged 60, sought relief on November 17, 1913, for a gradual loss of vision of six months' duration. On examination, a mature cataract was found in the left eye and an incipient cataract in the right. The patient had complete ptosis in both eyes and could not move the eyes in any direction. The pupils in both eyes reacted to light, direct and consensual. The personal and family histories were negative and, as far as could be determined, the condition has always existed. Up to six months ago his vision had been good, though it was necessary in reading to follow the words by turning his head or by moving the lines. In Dr. Crigler's opinion, the condition is congenital and due to a lack of development of the nuclei that supply the extraocular muscles, the centers for the pupil and accommodation not being affected.

Dr. M. J. Schoenberg was also of the opinion that this was a congenital affection.

Dr. W. B. Weidler presented a case of **congenital anomaly: anterior synechia of the pupillary membrane.** The patient was a boy who had had poor sight in the right eye since birth, though there was no history of any inflammation or accident. The vision at present in the right eye is, fingers at 3½ feet, the left $\frac{20}{40}$. The right eye presents a dense leucoma in the lower and outer part of the cornea. In the center of the

cornea there is another slight opacity. Both of these seem to be situated in the deeper layers of the cornea. There are several tags of pupillary membrane near the ciliary margin of the iris, which are attached to the posterior surface of the cornea. In the upper and outer quadrant of the lesser iris circle there are about ten or twelve pupillary tags or threads which also are attached to the posterior surface of the cornea.

Dr. J. WOLFF presented a case of **restoration of the conjunctival cul-de-sac,** in a patient where the eye had been lost at six years of age. The socket was obliterated and an operation had previously been attempted. Dr. Wolff separated the lids which he found united, and as soon as the wound began to granulate a Wolff graft from the leg was inserted in the upper cul-de-sac. The graft was held in place by means of a lead plate. A similar operation was performed in the lower cul-de-sac two weeks later. Four operations were necessary.

Dr. WEEKS thought the result was fairly good, but that the end had been accomplished in a roundabout way. The use of lead plates had been originally brought out by Wilder. Dr. Weeks does not find it necessary to wait until the surface of the wound is granulating, before applying the graft. Out of 32 cases which he has operated upon, there has been a failure in only one.

Dr. WOLFF presented a case of **implantation of fat in Tenon's capsule.**

Dr. G. H. GROUT presented a case of **permanent impairment of vision following gastro-intestinal hemorrhage.** (Published in full in this issue.)

Dr. WEEKS thought this a most interesting case. Impairment of vision from loss of blood was usually due to hemorrhage from the gastro-intestinal tract, or from a hemorrhage from the uterus. A case of the latter kind he had had an opportunity of examining. The patient did not recover. The lesion was probably a starvation atrophy of the retinal neurons.

Dr. TYSON said the man had been drinking the night before and possibly wood alcohol might be a factor.

Dr. CASSELL wanted to know if transfusion had any effect on restoring the retinal function.

Dr. WEEKS said no.

Dr. H. H. TYSON presented a case of **keratitis disciformis.** Laborer, aged 50. Right eye sore for past six weeks, had pain during first two weeks, but none recently. Previous history of alcoholism, pulmonary tuberculosis, and syphilis. St. pr., disk-shaped opacity center of right cornea, surface of cornea being uneven and stippled. Sensibility diminished. Vision right eye $\frac{1}{200}$, left $\frac{20}{20}$.

According to Fuchs, these cases are supposed to be caused by ectogenic infection, with inflammatory infiltration following, and scar tissue formation later. This being the third case Dr. Tyson has seen during the past two years, all with tubercular history and positive tuberculin reaction, in one case of which vision improved materially under tuberculin injections, he questions what rôle tuberculosis plays in this affection either as an exciting or predisposing cause.

Dr. SCHOENBERG said he had a case two years ago which he thought was tuberculous in origin, and which improved on tuberculin.

Dr. WEEKS does not think the association of tuberculosis with keratitis disciformis has been proven, as all cases recover, leaving opacity of the cornea.

Dr. JOHN E. WEEKS read a paper on the **pathology of glaucoma,** which was illustrated by lantern slides. In his paper Dr. Weeks considered the various structures and tissues of the eye in logical order, giving the changes that occur in these parts, and concluded by noting changes as a whole that predominate in the various types of glaucoma.

The paper was discussed by Dr. GRUENING, Dr. SCHOENBERG, and Dr. REESE.

MEETING OF FEBRUARY 16, 1914.

Dr. T. R. CHAMBERS presented a patient with **detached retina with peculiar striæ running from disk.** From the disk a floating cloud projected out into the vitreous. The detachment of the retina was below and there were no other symptoms of choroiditis.

Dr. CLAIBORNE showed a drawing of **partial coloboma of the head of the optic nerve,** which is ordinarily spoken of as "hole in the disk." It occurred in a girl of 18, whose eyes were

otherwise normal. About 25 cases of this anomaly have been reported, though a certain number of borderline cases between this and true coloboma of the optic disk may be found in literature. The majority of them are on the temporal side, as in this case. The holes are more or less elliptical in shape, and in some a blood-vessel lies at the bottom of the hole, as in this case. This case differs from the majority in that the hole extended clear up to the edge of the scleral ring, whereas ordinarily it does not extend so far. Its depth was 3*mm.* The bottom of the pit had a slightly stippled appearance. In 5 cases the depression contained pigment. According to Carl Williams, they have all been found in adults; the youngest one being 18, but it is more than probable that it is congenital and simply has been discovered later in life.

Monthus and Opin have explained the presence of these pits. It seems quite certain that they have no pathological significance and in no way have disturbed the vision or the field of vision.

Dr. DIEM presented a case of **embolism of the central artery,** in a girl of 16. Two days ago while patient was combing her hair, she had a sudden pain in the left eye. The fundus presented the usual appearance of closure of the retinal artery, except that next to the disk there was a preserved area, but no cilio-retinal vessel was visible. There is no sight. Patient has a cardiac lesion. (Four weeks later, V. = o. Optic atrophy.)

Dr. J. A. GEHRUNG presented four patients from Dr. Lambert's clinic at the New York Eye and Ear Infirmary. Two cases of **congenital dislocation of the lenses,** both eyes in two children, a brother and sister, the mother also presenting colobomas of both lenses. Both lenses of the girl have colobomas. Vision O. D. $\frac{5}{200}$, O. S. $\frac{3}{200}$. No improvement with glasses. Double dislocation of lenses. Without glasses, but with much trouble and squinting, reads some letters in J. No. 2. Blue-gray iris, lens quite clear. O. D. lens dislocation at axis 135°, covers ½ pupil upward. O. S. dislocation at axis 90°, ½ pupil upwards.

Brother, double dislocation of lenses. Vision, O. D. $\frac{5}{200}$, O. S. $\frac{5}{200}$, O. U. $\frac{8}{200}$. Lenses dislocated, O. D. axis 135°, O. S. axis 45° upwards, $\frac{2}{3}$ of pupil covered. At upper and inner margin of lenses is a lenticular coloboma, both eyes. The axes of

dislocation seem to show a probable relation to the frequent axes shown in astigmatism. This suggests the question, Is there a relationship in the causative factors of astigmatism and the dislocation of these lenses as both conditions are probably congenital? Is there a co-ordination in development and mal-development?

The mother of these children shows marked coloboma of lens O. S. and less marked in O. D., both at infero-internal border of lens.

Case of Pigmentation in Cornea. Peculiar grayish-brown pigmentation of corneal tissue proper. Gives history of possible injury as small boy. On first glance, with small pupil, looks like a melanosarcoma of iris, pressing forward against cornea. On careful oblique illumination, and looking from the opposite side, the iris shows clean and clear. Condition exists in the corneal tissue only. On looking through loupe, a dark brown pigmentation, one slightly annular like a pockmark, and another more evenly distributed area of pigmentation, are seen. This is surrounded and mixed with grayish dustlike deposits. These are all in the corneal tissue. Bowman's membrane seems clear. Fundus normal, lens clear. Hematin deposits and all metallic conditions have been considered as causes, but none seems to explain.

Dr. Gehrung wanted to know the opinion of the Section as to operating on the two cases of dislocated lenses.

Dr. CLAIBORNE suggested needling one eye at a time and allowing the lens to absorb by nature.

Dr. Claiborne, in discussing Dr. Gehrung's case of pigmentation of the cornea, wanted to know if an X-ray had been taken. He said it looked like a case of siderosis.

Dr. BELL presented a case of **foreign body in the lens.** Man was first seen in Dr. Marple's clinic at the Infirmary on January 28th. Patient, age 29, had a cataract in the right eye, and a careful interrogation could not elicit from him any history of injury to the eye. The occurrence, however, of a cataract in a person of his age suggested the propriety of having an X-ray taken, and this latter revealed a small foreign body in the lens. On January 30th the tip of a Johnson magnet was applied to the cornea and at once the foreign body sprang from the depth of the lens. A linear section was then made

with a keratome and immediately on its removal the foreign body came out with some of the soft lens matter. The remainder of the soft lens matter was irrigated out, and the patient was discharged the next week with a black pupil and scarcely any ocular injection. Dr. Bell showed a plotting of the foreign body in Dr. Marple's case which showed the steel on the anterior surface of the lens.

Dr. DIXON explained how that happened. He said the lens had become swollen and the anterior chamber shallow; that in charting eyes, he allowed 24*mm* for the length of the eye, and in plotting this foreign body it appeared on the anterior surface of the lens when it really was in the substance of the lens.

Dr. REESE reported 3 cases of **hypopituitarism** and showed radiograms of each. One case, a man twenty-five years of age, had been under observation for six years and just before his death in January, 1914, there was monocular choked disk. Prior to this there was simple atrophy of both optic nerves and bitemporal hemianopsia. There was definite hypotrichosis and the X-ray showed no acromegalic change. Anaphrodisia and drowsiness were marked.

The second case was a woman forty-three years old who had no intraocular changes and normal vision with correction. The two neighborhood symptoms of greatest diagnostic value were bitemporal achromatopsia and enlarged sella. She had amenorrhea for twelve years and the past year she had gained steadily in weight.

The third case was a man fifty-six years old who had simple atrophy of both optic nerves and bitemporal hemianopsia.

The Wassermann test was negative and Wernicke pupillary reaction was absent in all three cases. The radiograms showed marked changes in the outlines of the sella turcica and in two of the cases the floor of the sella was depressed. Sellar decompression was advised in cases one and three.

Dr. CRIGLER, referred to the case shown by him before the Section a few months ago. The patient, a girl 11 years of age, with all the symptoms of hypopituitarism with marked choking of both disks and other symptoms of intracranial pressure before the vision became affected. In spite of the advice of several good men, the family physician declined to give his

consent to operation. The patient to-day is totally blind. The mother regrets not having had the child operated on. The child is steadily increasing in obesity, but mentality is unaffected. This case is unusual in that bilateral choking of the disks occurred as one of the first manifestations of the disease.

Dr. MAY reported three cases all operated on by Dr. Cushing. All had improved. Vision improved in one case.

Dr. TYSON has observed a case which has been running a low temperature. Most of these cases run low temperatures. In Dr. Tyson's case the temperature was 96° F. most of the time.

Dr. MAY read a short paper on **Soap and water and opticians.** Investigation has shown that in none of the principal optical establishments of this city are there facilities for washing the hands. The possibility of the transmission of infection by the hands of the optician is therefore present. Dr. May thinks that proper facilities for washing the hands should be given in plain view of the customer. He also deprecates the use of a towel or a piece of chamois for continuous use in wiping the lenses.

Dr. DIXON in dicussing this paper said that he thought we might go a step farther and look after the cleanliness of the prescription department of our drug stores. He said: "I do not know how many physicians go behind the prescription counter of our druggists. They are all dirty. The vast majority of druggists in this city have no idea about the filth of the back of their stores."

REPORT OF THE TRANSACTIONS OF THE SECTION ON OPHTHALMOLOGY OF THE ROYAL SOCIETY OF MEDICINE.

By Mr. C. DEVEREUX MARSHALL, F.R.C.S., London.

The ordinary meeting of the Section was held on Wednesday, 4th of February, under the Presidency of Sir Anderson Critchett, Bart.

Mr. Frank Moxon showed a case of **congenital diffuse opacity of the cornea** in two sisters. The children and the family had been healthy; there was no history of syphilis, tubercle, or miscarriages. One of the children was ill with sickness and diarrhea at a year old. Both Wassermann and von Pirquet reactions were negative. There was slight photophobia, but the fields of vision appeared to be normal. The cornea was milky, but there was a fairly good fundus reflex. The opaque spots were fairly evenly distributed throughout the thickness of the cornea. Lenses and vitreous were clear. Mr. J. H. Fisher considered that the tension in all four eyes was somewhat raised, and that there was a possibility of its being a variant of congenital glaucoma; the changes were mainly in the epithelium.

Mr. Angus MacNab showed a case of **nodular opacity of the cornea,** which he considered bore a relation to Mr. Moxon's case. In a similar case, shown before the Ophthalmological Society, the epithelium over the nodules was somewhat heaped up. At the extreme periphery of the cornea there were loops of vessels which passed into the cornea, and that seemed to be slightly so in Mr. Moxon's case.

Mr. J. B. Lawford showed a case of **brawny scleritis.** The ætiology, as in all these cases, was obscure. It was an inflammatory process, with much infiltration by cells; there was

nothing to suggest new growth. Every test applied to the case had turned out to be negative.

Mr. W. S. INMAN showed, through Mr. LESLIE PATON, a case of **iridocyclitis** in a boy who had been living in Northern Nigeria and was now suffering from trypanosomiasis Gambiensi. Last October his left eye became inflamed, and three weeks ago its fellow behaved similarly. Mr. Inman had the Wassermann reaction done, and it was positive; he probably had an idea of a syphilitic origin. But Wassermann was positive in the disease afflicting the patient. There was a beautifully marked circinate rash on the front of the thigh, and enlarged, soft posterior cervical glands, from which, failing it being found in the blood, the trypanosome could generally be recovered. The Rhodesian form of the disease seemed to be more severe than the Gambian. Dr. Daniel, whom he asked about the case, said he would rather treat such a case with repeated small doses of atoxyl than with salvarsan. Mr. TREACHER COLLINS referred to a case of sleeping sickness which he saw with Sir Patrick Manson, and described the appearances. Eye diseases seemed to be very uncommon in connection with sleeping sickness.

Mr. ORMOND showed a case for diagnosis, and Mr. Whitehead (Leeds) discussed it.

Mr. CUNNINGHAM showed a case of **massive exudate in the retina.**

The Section then proceeded to discuss the subject: **The use of salvarsan in ophthalmic practice,** and it was opened by Mr. W. Lang. He reviewed the knowledge up to date, and discussed the probable mode of action of salvarsan. During the early stages of syphilis, before the spirochætes had reached the vascular tissues, salvarsan acted readily and quickly; but later it was less efficacious, though gummata of iris, sclerotic, and ciliary body seemed to be favorably influenced by the treatment. With regard to parasyphilitic diseases, the Argyll-Robertson pupil had been once known to again react to light following intravenous injections of "606." Ophthalmoplegia external and primary optic atrophy had not been definitely improved by the treatment. After injecting a large dose of salvarsan into a rabbit's vein, none of it was found in the cornea, though specially searched for. The usual dosage

of salvarsan for the adult male was .6 of a gram, and for the adult female .5 of a gram; while if neo-salvarsan were used, the dose must be 50% more. The destruction of the parasites should be effected as soon as possible, before they had the opportunity of becoming immune to the drug. He instanced cases in which greatly increased doses with that object had been very efficacious. Thanks largely to Mr. Browning, salvarsan was now known to be a successful treatment for sympathetic ophthalmia, and studies on the blood condition enabled one to foresee the onset of the condition.

Lieut.-Colonel GIBBARD, R.A.M.C., said that though salvarsan had not supplanted mercury, its action was more rapid and intense, and he narrated some striking cases illustrating this fact. Secondary lesions seemed to be more intractable than primary, and relapses were more frequent. The feature of secondary cases was the tendency to affections of the central nervous system, which was much more often involved than was formerly supposed. He did not believe this was due to salvarsan; cases were heard of more because everyone was on the look-out for untoward symptoms following the use of the new drug salvarsan. He knew of only two cases of cerebral nerve disturbance in 1200 cases where the drug was used. And where this did occur, an increased dosage caused a disappearance of the trouble. Syphilitic meningitis was more prone to relapses, because of the inaccessibility of the subarachnoid space. Having killed off the main army of the organisms, it seemed necessary to keep in the blood a remedy which would deal with scattered survivors. At his headquarters they had given 4000 intravenous injections, and the soldiers concerned were followed up wherever they went.

Mr. S. H. BROWNING read an interesting paper in which he detailed his cytological studies, and the reasoning which led him to suggest giving salvarsan for sympathetic ophthalmitis. He had had excellent results in syphilis from salvarsan given *per rectum;* that the drug was absorbed when so given was proved by the occurrence of an arsenical rash following the method. Out of 500 to 600 cases, he had not heard of a single instance of ocular palsy, optic neuritis, or other similar trouble. The most successful results from the method were in syphilitic iritis; gummata of the sclera also vanished in a marvelous

manner with salvarsan and potassium iodide. He agreed with the general opinion that in interstitial keratitis it was not much good, though there had been one or two notable exceptions. His usual method was to give the drug intravenously. Neo-salvarsan was less toxic than salvarsan.

The adjourned meeting of the Section was held on Monday, February 16th, for the purpose of concluding the discussion on the subject of the use of salvarsan in ophthalmic practice. The chair was occupied by the President, Sir Anderson Critchett, Bart. C.V.O., F.R.C.S., Ed.

Mr. W. LANG showed a case which, in 1908, developed **sympathetic ophthalmia** following a gunshot wound. Much benefit had occurred from giving salvarsan.

Mr. PARSONS, discussing the case, thought it showed that sympathetic ophthalmitis was a general infection; and it would be difficult to believe that a purely local condition could persist for three years, the interval between the injury in this case and the subsidence of the sympathetic trouble.

Mr. FISHER also spoke of two cases in which Mr. Browning forecasted the onset of sympathetic trouble from the blood count.

The debate on the use of salvarsan was continued by Lieut.-Col. R. H. ELLIOT, I.M.S. He said he had had no experience with neo-salvarsan. As he had had an experience of optic atrophy following the use of soamin, he asked the Surgeon-General's assistance in getting reports of cases in which the same calamity followed the use of salvarsan; but none was reported, and he believed the reason was that they did not occur; they were able men, and fully on their guard. On the other hand, it was their experience that those cases which presented signs of optic neuritis, of presumably syphilitic origin, acted excellently to the remedy. As the whole of a dose of salvarsan seemed to be eliminated from the system in ten days, he thought any trouble which was likely to arise would be evident in a month or so, after which period no anxiety need be felt. In his large practice in Madras, the intramuscular method was abandoned in favor of the intravenous, largely on account of the pain caused by the former, which in many cases necessitated the use of morphia. A Wassermann was done in each case, and the administration was not con-

tinued after that test was negative. In no case did they abandon mercury and iodide, which were given in the intervals. The most startling benefits were obtained in recent or acute cases involving the uveal tract. One man was practically blind, with a congested eye, his vitreous was full of opacities, and a gummatous mass involved the ciliary body; yet within a week of using the remedy, he could count fingers at 20 to 30 feet. His general nutrition also improved. With muscle palsies and optic neuritis the results were very satisfactory, though not with tabetic conditions. He knew of two deaths following the use of salvarsan, both in marasmic patients, who probably would not have lived long in any case. With regard to sympathetic ophthalmitis, Gifford, of Omaha, from the results obtained in it from atoxyl and salvarsan, argued that it was a general protozoal disease.

Mr. E. ERSKIN HENDERSON reported two cases of severe **iridocyclitis** following cataract extraction on the 8th and 10th day respectively. Ordinary treatment supplemented by staphylococcal vaccines proved of no value, but after two doses of neo-salvarsan both cases recovered. In one case, a man of 54, he got after needling $\frac{6}{6}$ and J. 1. In the second case, a woman aged 72, iridotomy will probably be necessary. Mr. Henderson said that he was led to make a trial of the drug in these cases from the results obtained in sympathetic ophthalmia, as these two eyes were of a type that might have led to that affection, and if the remedy were used in the sympathetic eye, why not in the exciter?

Dr. ALEXANDER FLEMMING said that when salvarsan was introduced into this country it was said to have ruined many eyes; but there seemed no real evidence that the drug had produced an evil effect on any eye; not any cases of optic nerve trouble had followed its use at St. Mary's Hospital. He preferred salvarsan to neo-salvarsan, though the latter was very easy to use. He had never seen much benefit from salvarsan in interstitial keratitis. In one case, a chancre of the inner canthus disappeared in a few days under the treatment. In choroiditis the results were very rapid and complete. In one case an Argyll–Robertson pupil, in a case diagnosed by a physician as tabes, became a normal pupil under the treatment.

Major HARRISON thought the timidity felt about using salvarsan was largely due to the evil repute of atoxyl and soamin, but there could be no doubt about the beneficial effects of salvarsan. He had seen a case in which omission to use salvarsan on account of its supposed neurotrophic effect on cerebral nerves resulted in a calamity. He proceeded to discuss points in the technique, and expressed the opinion that as all the salvarsan given could not be collected in the urine, probably the drug was not entirely eliminated from the system as soon as was supposed. Still, by spacing-out the doses at intervals of not less than a fortnight, any cumulative effect need not be feared. If a case seemed to indicate more frequent doses, he thought there would be little danger. He had not had any catastrophes in his practice with salvarsan.

Mr. J. B. LAWFORD read notes of a severe case of **post-operative plastic iritis** treated by neo-salvarsan, the patient being a man *æt.* 60, the subject of acute gout. The operation was extraction and iridectomy. There followed hazy cornea, ciliary injection, exudation, and the formation of a hypopyon. A mixed staphylococcus vaccine produced no visible effect. Nineteen days after the extraction, .9 gram of neo-salvarsan was injected intravenously, and in two days there was definite improvement; while four days later the hypopyon was very small, and the congestion was diminishing. He went home, but returned later, and the hypopyon had returned. A similar dose of neo-salvarsan was injected, and almost immediately the eye became brighter, and there was general marked improvement.

Mr. BROWNING, in answer to a number of questions, admitted that the blood count, by which one could forecast the onset of sympathetic trouble, was not infallible, but it was true in the great proportion of cases. The discovery of this particular blood count did not mean that the eye would be inevitably excised; efforts to save the eye would be persisted in as long as they were of any avail.

Mr. BASIL LANG pointed out that many of these cases of injury of the ciliary region occurred in children, and it should be remembered that the total number of leucocytes in the blood varied from the moment of birth until after puberty. Until the second or third year of age, 80% of the blood cells

present were of the lymphocyte type; *i.e.*, large mononuclears, large lymphocytes, and small lymphocytes. Therefore finding a child with such a blood count must not be taken to mean that it was on the eve of sympathetic ophthalmia. He believed salvarsan to be a very good tonic, from his observation on cases.

At the meeting of the Sections on Neurology, Ophthalmology, and Otology on February 26th, a discussion on **nystagmus** was opened by Mr. W. T. HOLMES SPICER. He traced the history of our knowledge of the condition, and showed how the movements of the eyeballs varied from large and obvious excursions down to the finest of movements which could be detected only with the ophthalmoscope. Out of 200 cases, he found that in nearly 50% the movements of the eyes were in a horizontal direction; about 15% were rotary, about 12% vertical; 4% had mixed movements; 2% were irregular, 2% circumductory, 1% were con-divergent or disjunctive, and a few were odd and unclassified. The horizontal and vertical forms varied greatly in rapidity of movement and in range, and they were nearly always conjugate, but in a few cases they were con-divergent. The rotary cases were nearly always conjugate, but con-divergent ones had been seen.

Circumductory movements were usually conjugate; he had never seen one which was not. They were often rhythmical. Use of the eyes was essential to the existence of nystagmus. The eyes were quiet during sleep, and sometimes so in the dark. It sometimes happened that, on covering one eye, oscillations commenced in both. Unilateral nystagmus was not uncommon, and the movements were usually vertical, but not always. If the nystagmus had been recently acquired, a sensation of movement of objects was produced, but this was never noticed in the congenital cases. Nystagmus did not occur in those born blind, or who became so very soon after birth. It often became more marked with fatigue; in some cases light produced it, and in some it became more apparent in the dark.

He described the well-known fact that, after watching objects moving in one direction, a negative after-movement of stationary objects was seen, which made them appear to go

in the opposite direction. Some persons were able to produce nystagmus at will.

The most important causative factor in producing nystagmus was a defective retinal image, due to either a corneal or a lenticular lesion, or to some abnormal nerve or retinal condition. Errors of refraction had not been proved to cause this, but corrections of high degrees of astigmatism had often led to great improvement, or even to cessation of the nystagmus. Many of these patients had large refractive errors. Albinos and those with excessive pigmentation often had nystagmus. The pigment which affected eyes in this manner was usually supposed to be that of the retinal epithelium, but this could not be recognized by the ophthalmoscope, as the choroidal pigment masked it, and this might really be the case in those which were not obviously albinotic. In some cases the nystagmus was hereditary, but its cause not definitely ascertained.

As regards occupation-nystagmus, the weight of evidence was on the side of bad fixation being the primary cause, and besides miners, compositors were often affected. In spasmus nutans, the head movements preceded the nystagmus by a few weeks and they bore no relation to each other. This condition was supposed to be due to an instability of the motor centers. Mr. Spicer also briefly mentioned myoclonic nystagmus, injury cases, and those of toxic origin.

Dr. JAMES TAYLOR said that nystagmus, though usually associated with visual defects, was sometimes due to labyrinthine and nerve diseases, and he gave briefly the anatomical relations between these organs. With regard to the brain, nystagmus was most likely to follow disturbance of some co-ordinating mechanism in near relationship to the mid-brain, pons, and cerebellum. He discussed the mechanism of this theory. It was seen in disseminated sclerosis, Friedreich's ataxy, and syringomyelia. It was common in cerebellar disease, and in unilateral lesions. In most cases of cerebellar disease nystagmus was found, as also it was in local lesions in the vicinity of Deiter's nucleus. Besides the central motor mechanism, the peripheral nervous mechanism might produce it. The muscles themselves might cause it, as in myasthenia gravis. He thought that some of the conditions he had pointed out might be taken into consideration in order to

explain the presence of nystagmus associated with visual conditions.

Mr. SYDNEY SCOTT said that labyrinthine conditions undoubtedly produced nystagmus. Rhythmic nystagmus might be produced in normal people by applying excessive stimuli to the semicircular canals, such as by rapid rotation, irrigating the ear with hot or cold water, or the galvanic current. He described the anatomy and the physiology of these canals, and expressed the view that "the deviation of the head and eyes is in the same direction as the current in the endolymph, and the nystagmus is in the opposite direction." He described the effect produced by stimulating each of the three canals by rotation of the head in the different planes, and also by the galvanic current.

He had met with 23 examples of the "fistel symptom," and in nearly every case he had been able to verify the existence of a labyrinthine fistula, though many cases of fistula occurred without the "fistel symptom" being produced. As regards spontaneous labyrinthine nystagmus, it resembled induced nystagmus in kind and degree, being always symmetrical and generally unilateral. The less acute forms were sometimes seen in cases of acute or chronic otitis media. Spontaneous rhythmic rotary nystagmus to one side was also met with when the opposite labyrinth had become functionless, and disappeared again when both became destroyed.

If the labyrinth were stimulated in cases of total blindness, such as resulted from primary optic atrophy unaccompanied by intracranial disease, rhythmic nystagmus could be provoked by rotation or irrigation. When one labyrinth was defunct, spontaneous nystagmus could be arrested by pressure on the carotid sheath of the normal side. It was possible to measure the strength of the stimulus required to produce nystagmus, for sometimes it was easier to be obtained on one side than the other. He described the various methods.

Cases were exhibited which illustrated various forms of nystagmus.

Sir Anderson Critchett, Bart., C. V. O., President of the Section on Ophthalmology, occupied the chair at the resumed discussion on **nystagmus,** on March 4th.

Dr. T. LISTER LLEWELLYN dealt with the relation of miner's nystagmus to general nystagmus. In the former, the oscillation of the eyeballs was only one—though an important one—of the physical signs and symptoms. In miners the nystagmus produced marked subjective symptoms, while in the ordinary person with nystagmus he might not have noticed it. In miners the oscillation was of a rotatory character, and was usually equally marked in both eyes. The nystagmus was increased on exertion, or by making the patient look up. It was usually brought to a standstill when the eyes were directed downwards. In general nystagmus the eye oscillation was generally lateral. The conditions producing nystagmus were those causing an inexact image to be formed on the retina; this was so in optic atrophy, marked errors of refraction, and corneal opacities. Albinism, with its lack of visual definition, was always associated with nystagmus. In dull illumination there was a tendency to use the peripheral portion of the retina. Arlt and Edridge-Green suggested that the movements had the object of bringing fresh portions of the retina into play. The miner in his work not only found great dullness but almost a complete absence of color-relief. In the better lighted mines there were but few cases of nystagmus. He related some very interesting observations on the lighting power of reflections from ordinary walls, which was practically absent from the face of the coal. Moreover, to be out of the way of the pick, the lamp was often six feet or more from the face of the coal, and the available light was often not more than one-third of a candle-power, and it fell on a substance capable of absorbing 86% of the rays. Safety-lamp pits were hotbeds of the disease. Of 900 consecutive cases of miner's nystagmus, 870 had worked with safety lamps, and 30 with candles, and 20 of the latter had at some time worked with safety lamps. He had noticed that several of the most severe cases of miner's nystagmus had fair hair and light-colored eyes. He did not agree with Snell that miner's nystagmus was due to the strain produced by the unnatural position of head and eyes while holing; the man really looked straight at the spot to which he directed his pick. Moreover, working in an unnatural position in a good light did not cause the disease. These patients complained of loss of sight, especially at night

time, of headache, giddiness, and intolerance of light. Marked cases caused mental depression, and there might be tremor of eyelids, eyebrows, and even of the shoulders. The ultimate cause of the condition was want of co-ordination in the mid-brain ocular center of Gowers, governing the associated movements of the eyes.

Dr. DAN MCKENZIE expressed agreement with the remarks of Dr. Llewellyn, as he found, while practising in a Scottish mining district, that there were very few cases of nystagmus among the miners, and they used naked lights, hence the illumination was superior to that given by the safety lamp. He proceeded to deal with the subject of vestibular nystagmus. He agreed that the movement of the endolymph in the semi-circular canal was never a steady round-and-round circulation. It was a wave-motion. He suggested that usually the rise or fall in endolymphatic pressure in the ampulla was quickly relieved by local excess of fluid passing into the inner position of the canal, and so round its undilated end, and this rapid equalization of pressure prevented undue stimulation of the end-organ. But when there was sustained pressure, as in continued rotation, the relief could not be brought about sufficiently rapidly, and excessive stimulation of the nerve ending would ensue, causing nystagmus and vertigo. With regard to spontaneous nystagmus of the labyrinth storm, the direction of this nystagmus should not be taken as the faithful guide as to which was the affected labyrinth, or to distinguish acute labyrinthitis from cerebellar abscess. He urged that the vestibulbar tests should be employed in all cases of mild or severe perceptive deafness, as it was useful for diagnosis and prognosis. He gave particulars of 36 cases, and drew the lessons from them.

Mr. R. J. COULTER (Newport) endorsed the views put forth by Dr. Llewellyn, and agreed that there was a neurosis as well as the oscillation of the eyes in subjects of miner's nystagmus. The idea that it was due to gases in the mine was quite given up. He exhibited a safety lamp which had been used eight hours, one not yet used, and an electric miner's lamp, and narrated a case in which a miner, about to give up work on account of nystagmus, was provided with an electric lamp and was still working, some two months later.

Mr. N. BISHOP HARMAN said he had examined the records of one thousand blind children that had come under his care during the past ten years with regard to the occurrence of nystagmus. Of the total, as many as 289 showed nystagmus, or more than 25 per cent. There were some very striking differences in the distribution of the symptom: some groups were free from the symptom, whilst others showed it in almost every case. He grouped the causes of blindness into three. I. Surface disease damaging the cornea. Purulent ophthalmia in the newborn accounted for most, and in this group almost every case showed nystagmus. Purulent conjunctivitis causing blindness in later years, from six months to seven years, was rarely accompanied or followed by nystagmus; only one certain case was found and there was in this a complication due to middle-ear disease. Again, severe ulceration of the cornea due to phlyctenular keratitis was never found to be associated with nystagmus. He thought this indicated that the first few weeks of life were of paramount importance in establishing the function of the macula and steady fixation; once that were established the front of the eyes might be damaged beyond repair without losing this steadiness.

In Group II he placed all forms of uveitis. Most were due to inherited syphilis. Here there was a marked contrast according as the uveitis affected the front or the back of the eye. In 160 cases of interstitial keratitis, most of severe order, there was no case of nystagmus; in 30 with posterior choroiditis there were 4 cases; in 181 cases of optic atrophy with or without disseminated choroiditis there were 94 cases of nystagmus. On the other hand, sympathetic disease, which caused both anterior and posterior uveitis, did not show nystagmus, at least there was none in his 16 cases. Group III comprised all manner of congenital defects. There was a striking difference between the occurrence of nystagmus in cataract of ante-natal and post-natal origin. In ante-natal cataract of all forms it was very common, being seen in 40 out of 94 cases; it was not seen in post-natal cases, for of 30 only one showed nystagmus and in that the date of origin was uncertain. In such congenital defects as albinism it was always present; it was very frequent in all forms of macular defect, and in family choroiditis. But it was infrequent in

buphthalmia and in retinitis pigmentosa, and this rather gave point to the hypothesis of the inflammatory origin of these conditions.

The third meeting of the Sections on Neurology, Ophthalmology, and Otology was held on Wednesday, March 11th, to conclude the debate on **nystagmus.** The chair was occupied by the President of the Section of Otology, Mr. RICHARD LAKE.

Dr. WILFRED HARRIS said nystagmus should not be assumed to exist unless the lateral movements were persistent and rhythmical during the test; the observer should also determine whether the nystagmus was a symptom of cerebrospinal disease, or was of ocular origin. Cases which did not belong to either of these groups, such as head-nodding, should also be recognized, and in the last-named form usually only one eye was affected. If, in early infancy, macular development was interfered with, such as by anterior polar cataract, so that there was not a clear image on the fovea, the cerebral co-ordination was not brought into play to keep the eye rigid, hence there were constant oscillatory movements. Ocular nystagmus might be said to be due to disease of the afferent path concerned with the reflex for fixation of the eyeballs. Occasionally in adults nystagmus might be due to defect of vision, and it might be uniocular. In nystagmus of central origin, the symptom was brought out especially on deviation of the eyes laterally or upwards, and was not apparent on fixation in the median line. Most intense nystagmus was occasionally set up by a tumor of the cerebrum, especially if the optic thalamus were involved by it. He mentioned cases of this, and recalled that Gowers made the same observation. The value of nystagmus for cerebral localization was not great, but it was usually suggestive of cerebellar disease. The most intense nystagmus might be an accompaniment of sub-tentorial disease.

Dr. ABRAHAMS explained the *modus operandi* followed by him in obtaining cinematographic records of nystagmoid movements. He said the human eye was a very capable micrometer, and was capable of appreciating a movement which the camera did not reveal. Some of the movements photographed were less than $\frac{1}{10}$ of a millimeter, and pic-

tures were taken at the rate of 25 to 30 per second. Miner's nystagmus was too fine to photograph.

Mr. O'MALLEY dealt with the two great types of nystagmus, ocular and vestibular; and exhibited tables of useful sub-classifications, with suggestions as to ætiology.

Mr. HAROLD GRIMSDALE spoke of his experiences with cases at the Royal Normal College for the Blind. Half the cases of nystagmus there had had ophthalmia neonatorum; and there were a large number of cases in which the nystagmus followed an accident to the cornea. Up to the age of 5, any severe disturbance of the cornea seemed to be followed by nystagmus. But the blind Principal, who lost his sight at the age of 4, following measles, showed no nystagmus. It was said that nystagmus never occurred in blind children, but he quoted a case to the contrary; the patient, a child, later recovered a fair degree of vision, and the presence of the nystagmus led him to hope that that might be so.

Mr. CRIDLAND dealt with the question of the restriction of the fields of vision for red, blue, and white in subjects of miner's nystagmus; this could be observed in the early stage and the improving stage of the condition. He possessed some 70 charts to illustrate the fact that in practically all cases contraction existed for red, blue, and white, but it was of the concentric type, and more or less symmetrical in shape. Occasionally there was an interlacing of the three fields. The restriction might persist even months after both subjective and objective signs had disappeared. Most of the cases showed blepharospasm, neck twitching, etc. The changes in the fields were akin to those seen in functional disease, and that lent support to the view that miner's nystagmus was a nervous condition.

Mr. ANGUS MACNAB spoke of the relative importance of the rods and cones in different degrees of illumination. With light reduction, the rods became the more important until the threshold of stimulation of the cones was passed. In the macula there were only cones; no rods, and after an eye had been subjected to low illumination, it gradually became adapted to its environment, and passed into a condition of dark adaptation. Miner's nystagmus was noticed to be most prevalent where the coal was most absorbent of the little light

there was; and the fixation of the subjects was in a state of very unstable equilibrium. The concentration of the miner on his blows also helped, in these circumstances, to produce the neurosis. He thought the influence of refractive error in the causation of nystagmus must be very small, though errors of muscle-balance might have some weight. It would be interesting to ascertain what proportion of affected miners suffered from heterophoria.

Mr. LAYTON said there were great differences of opinion as to the value of vestibular nerve tests, including nystagmus, in the diagnosis of nerve diseases. He raised the question as to how much of failure to correctly perform co-ordinate muscle movements was due to withdrawal of cerebral control, and how much to defect of the vestibular nerve. He was convinced that in a certain number of cases, vestibular reactions when correlated with evidence obtained from other sources would enable one to clinch a diagnosis, or detect a gross lesion which otherwise would seem equivocal. He thought every neurologist should learn to do these tests, or send their patients to otologists who could do so.

Dr. RUGG GUNN spoke of nystagmus as it affects albinos. In diseases of the retina associated with degeneration of the rods, there was the converse condition to night-blindness. An eye in that condition looking at the spectrum of sunlight found the red end shorten and disappear, while its broadest portion appeared to move towards the violet end. It occurred to him that if in the albino the cones were found to be functionless, this absence of function in the fixation point was a sufficient cause for the nystagmus, and also, perhaps, for the intense photophobia found. Such a person would be dark-adapted. He described the case of an albino, one of nine observed, in which this was so.

Mr. G. H. JENKINS spoke of labyrinthine nystagmus in relation to various canals, and Mr. PARSONS asked whether the albino described by Mr. Rugg Gunn was totally color-blind, because such persons showed the characteristics described.

Mr. HOLMES SPICER, Dr. JAMES TAYLOR, and Mr. SYDNEY SCOTT replied, and the President suggested that perhaps a Committee of representatives of the three Sections might present definite conclusions from the various points of view.

QUARTERLY REVIEW OF THE PROGRESS OF OPHTHALMOLOGY.

By H. KOELLNER, Berlin; W. KRAUSS, Marburg; R. KÜMMELL, Erlangen; W. LOEHLEIN, Greifswald; H. MEYER, Brandenburg; W. NICOLAI, Berlin; H. PAGENSTECHER, Strassburg; K. WESSELY, Würzburg; and M. WOLFRUM, Leipsic, with the Assistance of Drs. ALLING, New Haven; CALDERARO, Rome; CAUSÉ, Mayence; DANIS, Brussels; GILBERT, Munich; GROENHOLM, Helsingfors; v. POPPEN, St. Petersburg; TREUTLER, Dresden; and VISSER, Amsterdam.

THIRD QUARTER, 1913.

Edited by MATTHIAS LANCKTON FOSTER, M. D., New Rochelle.

I.—GENERAL OPHTHALMIC LITERATURE.

See Book Reviews.

II.—RELATIONS OF OPHTHALMIC TO GENERAL DISEASES, INCLUDING POISONS.

1. AUERBACH and BRANDT. **An important variety of course in multiple sclerosis.** *Medizinische Klinik*, 1913, No. 30, p. 1201.

2. CANTONNET. **Septic retinitis and metastatic ophthalmia.** *Archives d'ophtalmologie*, xxxiii., p. 425.

3. CHEVALLEREAU. **Ocular lesions in a case of polymorphous erythema.** *Annales d'oculistique*, cl., p. 209.

4. CONLON, F. A. **Five generations of blue sclerotics and associated osteoporosis.** *Boston Medical and Surgical Journal*, July 3, 1913.

5. FRIDENBERG, PERCY. **Central scotoma and blind-spot anomalies. Their clinical significance.** *Ophthalmology*, July, 1913.

6. HENKES, J. C. **A case of optic neuritis in a patient with degenerative polyneuritis.** *Nederlandsche Tijdschrift voor Geneeskunde*, 1913, ii., No. 1.

7. HOLLAENDER, HUGO. **A parasite of the blood as the agent of scrofulous diseases.** *Wiener medicinische Wochenschrift*, 1913, Nos. 26 and. 27, p. 1676.

8. KALASCHNIKOW, W. P. **Scleritis and gout.** *Zentralblatt f. prakt. Augenheilkunde*, July, 1913, p. 193.

9. MELLER, J. **Choked disk and paresis of the abducens in chlorosis.** *Ibid.*, August–September, 1913, p. 271.

10. ORMOND. **Two cases of permanent hemianopsia following severe attacks of migraine.** *Ophthalmic Review*, xxxii., p. 193.

11. PATON. **Indications for operation on cerebral tumors from the point of view of the ophthalmic surgeon.** Lancet, Sept. 27, 1913, p. 928.

12. RUSCHE. **The relations of the infectious diseases to the eye.** *Zeitschrift für Augenheilkunde*, July, 1913, p. 10.

13. STOCK. **Hemorrhages in the retina in miliary tuberculosis.** *Klin. Monatsbl. f. Augenheilkunde*, September, 1913, p. 411.

14. STUELP. **Etiology of the so-called chronic articular rheumatism with eye complications.** *Versamml. deutsch. Naturforscher u. Aerzte in Wien*, September 21 to 28, 1913.

15. TOULANT, CHEVALLIER, and DE JONG. **Two cases of episcleritis in the course of a polymorphous erythema.** *Annales d'oculistique*, cl., p. 209.

16. UHTHOFF, W. **The cure or improvement of intracranial tuberculous processes with eye symptoms.** *Klin. Monatsbl. f. Augenh.*, Sept., 1913, p. 411.

17. YAMAGUCHI. **Xanthopsia from misuse of santonin.** *Ibid.*, July, p. 46.

CONLON (4, **Five generations of blue sclerotics and associated osteoporosis**) found certain members of a family affected with this anomaly. The father had markedly blue sclerotics, and had broken a wrist and three ribs. His sister had blue sclerotics and broke her hip. Both of the sister's children had the same affection, but no history of fractures. The patient's mother, her sister, and the latter's two children showed the same anomaly. The patient's five children also have blue sclerotics, and three of these have given evidence of bone fragility. There were no signs of other anomalies, such as colobomas, which have been observed frequently in these cases.

ALLING.

FRIDENBERG (5, **Central scotoma and blind-spot anomalies**), after discussing the various causes of retrobulbar neuritis, advises opening the sphenoid in all cases of blind-spot enlargement, central scotoma, and other visual-field anomalies of indeterminate origin, even in the absence of choked disk or neuritis, excluding of course other causes such as hysterical or tobacco amblyopia, intestinal decomposition, or cerebral disease. He thinks that the observation of Kennedy, that retrobulbar neuritis followed by atrophy on the side of the disease and a concomitant papillœdema of the opposite side is indicative of a tumor or abscess of the frontal lobe, is not without exception, since a distended sphenoid, or posterior

ethmoid sinus, might directly or indirectly produce the same signs. He also discusses ring scotoma and enlargement of the blind spot, noting the frequency of sinus disease as the cause of these signs. ALLING.

HOLLAENDER (7, **A parasite of the blood as the agent of scrofulous disease**) has demonstrated a parasite in the blood of tuberculous patients, especially those who are lymphatic and scrofulous, which he thinks is the agent of scrofula. The pathological importance of this parasite seems to lie in the destruction of leucocytes, particularly the macrophagi, and thus to set free the micro-organisms contained in the latter, especially the tubercle bacilli. The reactive consequence is the mobilization of the leucocytes with swelling and enlargement of the lymphatic glands, and the production of the clinical picture of scrofulosis.

The peculiar symptom-complex of choked disk and paresis of the abducens in chlorosis is discussed by MELLER (9, **(Choked disk and paresis of the abducens in chlorosis)**. Similar eye symptoms have been described by various authors in otitis media, after great loss of blood, and after extraction of teeth. All of these cases can be explained best and most easily through the formation of thrombi in the cavernous sinus, and as in chlorosis the blood has a great tendency to coagulate, the author thinks that such thrombosis is probably the cause of this peculiar complex.

TOULANT, CHEVALLIER, and DE JONG (15, **Episcleritis in polymorphous erythema**) observed in a case of papular, vesicular polymorphous erythema a bilateral, symmetrical episcleritis in parts of the eyeball covered by the lids. Toward the end of the affection, which recovered in two months, two small blebs resembling phlyctenulæ appeared in the conjunctiva. In another case, one of nodular polymorphous erythema, there was only a single episcleral node which healed in two weeks. CAUSÉ.

CHEVALLEREAU (3, **Ocular lesions in polymorphous erythema**) saw in a patient 15 years old, suffering from exudative polymorphous erythema of the brow, a disease of the lower lid and conjunctiva. In the latter a band-like injection was formed from the nasal margin of the cornea to the inner canthus. CAUSÉ.

RUSCHE'S (12, **Relations of infectious diseases to the eye**) first case was that of a child 7 years old, whose vision failed during an attack of scarlet fever. Six weeks later an optic neuritis was present in both eyes. Recovery took place with normal vision, although a paleness was left of the temporal sectors of both papillæ. In his second case there was a unilateral inflammation of the uveal tract in an attack of acute rheumatism complicated with a disease resembling typhoid. In the blood there were bacilli of the colon group; the blood serum agglutinated paratyphus A 1:50. The course of the disease was rapid and ended in death within three weeks. The grave involvement of the affected eye was striking, as the eye was very quickly lost through atrophy. As no autopsy was permitted, the question must remain open whether this was a case of infection of the eye with streptococci, paratyphus bacilli, bacterium coli, or with a mixture of these.

According to KALASCHNIKOW (8, **Scleritis and gout**) most cases of scleritis are closely connected with gout. The eye with Tenon's capsule is to be looked upon as an enarthrosis, similar to the hip joint, and this is a guide to the ætiology and treatment of diseases of the sclera. Gout is present in most cases of acute and chronic scleritis; syphilis and tuberculosis are much less common. The treatment should be both general and local. For the latter he uses hot applications and bandage, later massage with ointments. To improve the circulation he prefers eserine to atropine.

STUELP (14, **Rheumatic eye diseases**) claims that rheumatic eye disease and chronic articular rheumatism can no longer be said to exist, but that various causes lie at the bottom of these diseases. The causes of the multiform chronic monarthritides are traumatism, neuropathic influences, acute and chronic infectious diseases, especially gonorrhea, syphilis, and tuberculosis, which also affect the eye. He refers to Poncet's teaching that the one cause of the febrile secondary, and of the non-febrile primary, progressive polyarthritis ankylosans et deformans is tuberculosis, and considers that theory to be based on insufficient foundations, especially as in all the published cases a positive objective exclusion of other causes is wanting. From his own observations, in which diseases of the vascular system, chronic lead poisoning,

gonorrhea, and syphilis could be demonstrated, he warns against being satisfied with the determination of tuberculous symptoms alone, and recommends an examination for gleet, a bacteriological examination of the urethral and cervical mucous membrane, and Wassermann's test.

KOELLNER.

STOCK (13, **Hemorrhages in the retina in miliary tuberculosis**) saw hemorrhages appear in the retina during the course of an obscure febrile disease. Shortly before death miliary tubercles could be seen in the choroid. Autopsy revealed miliary tuberculosis. These hemorrhages were analogous to the early hemorrhages from the lungs in miliary tuberculosis. Relationship also existed perhaps with the juvenile periphlebitis retinalis and recurrent hemorrhages.

UHTHOFF (16, **Cure or improvement of intracranial tuberculous processes with eye symptoms**) contributes three observations of his own to the elucidation of the questions concerning the cure or improvement of these conditions. (1) A chronic tuberculous cerebrospinal meningitis with tuberculous iritis and tuberculous patches in the fundus, which recovered within a few months under treatment with tuberculin. (2) A serious affection of the cerebellum in a child 3 years old, with bilateral optic neuritis and typical tubercles of the choroid, which resulted in optic atrophy and atrophic spots in the choroid, but recovery otherwise. (3) A solitary tubercle of the pons in pulmonary phthisis, with a negative ophthalmoscopic condition. After improvement for a year a recurrence took place which resulted in death. He concludes from a consideration of the reported cases of recovery that repeated careful lumbar punctures seem to have produced the best results.

HENKES (6, **Optic neuritis in degenerative polyneuritis**) gives the clinical history of a case in which optic neuritis appeared as the initial symptom of polyneuritis. The patient had a polyp in the left antrum and swollen mucous membrane in the right, treatment of which caused a transient improvement of the vision, although the optic neuritis was not of rhinogenous origin.

VISSER.

AUERBACH and BRANDT (1, **An important variety of course in multiple sclerosis**) find that in the majority of their cases this disease affected young or middle-aged persons, and that it

began usually with no precursory symptoms, or with only insignificant ones, such as headache and dizziness, presenting a considerable disturbance of vision, as a rule, of only one eye. The perimetric test showed the fields to have normal external boundaries, but a central or paracentral scotoma, usually absolute for color and relative for white, was always present. Extensive movements of the eyes, and passive pressure of the eye backward, were painful. The direct reaction of the pupil to light was reduced. In the great majority the condition was one of retrobulbar neuritis with a normal-appearing fundus. One or more symptoms of disseminated sclerosis could often be demonstrated, although only suggestively. Other authors have mentioned similar conditions in the differential diagnosis from hysteria, cerebrospinal syphilis, tabes, and tumor of the brain. The affection of the optic nerve may precede the other symptoms of the disease by as much as fifteen years. Theoretically this course of an acute retrobulbar neuritis is an indication that multiple sclerosis is of an inflammatory character, particularly when taken in conjunction with the anatomical conditions that indicate inflammatory processes. The writers think that if the acute and chronic retrobulbar neuritis of other origin is measurably proved to be always produced by organized or non-organized poisons, it seems to be necessary to ascribe the acute neuritis of multiple sclerosis to a congenital anomaly of the nerve elements. In particular they saw the clinical picture appear after an attack of influenza. On the other hand they hold that a congenital or acquired predisposition must be present, as otherwise the disease would be observed more frequently.

CANTONNET (2, **Septic retinitis and metastatic ophthalmia**) observed a septic retinitis in one eye, and a metastatic panophthalmitis in the other of a woman 53 years old during the course of a pyæmia. The patient died three days after the onset of the eye symptoms. He is of the opinion that this was not an accidental coincidence of two different diseases, but that they were ætiologically the same symptoms of pyæmia, differing only in degree. The septic retinitis was probably produced by the toxines, while the panophthalmitis resulted from the direct metastasis of the microbes. The former is frequently the forerunner of the latter. CAUSÉ.

YAMAGUCHI (17, **Xanthopsia from misuse of santonin**) reports a case of this nature which is remarkable because of the abnormally long duration of the yellow vision. The patient had frequently had yellow vision for about a day after taking small doses of santonin; at this time he had taken about 0.5 gram of the drug within four days. The resulting yellow vision soon disappeared from his left eye, but persisted obstinately in his right, especially in the center of the field, and did not disappear completely until after the lapse of thirty-seven days.

PATON (11, **Indications for operation on cerebral tumors from the point of view of the ophthalmic surgeon**) says that the opinion of the ophthalmic surgeon may be asked as to whether the operation is necessary to prevent loss of sight or whether recovery of any loss of sight may follow the operation. In the early stages, if the tumor is not directly pressing on the chiasma or on one or both of the optic nerves, the chief pressure on the chiasmal neighborhood is probably due to fluid pressure. It is not sufficient to interfere with the normal conduction of nerve impulse from the retina, except in a temporary way. In this stage there is no increase in connective-tissue elements of the disk, and no degeneration of the nerve fibers. Even where the œdema has been so great as to give rise to macular signs complete restoration of normal function and appearance may take place on relief of pressure.

In the next stage changes commence which do not allow of such complete recovery. If this more solid pressure is prolonged, then pressure atrophy of the optic nerve may take place and the papillœdema subside. Early atrophy may be brought about in this way. If the œdema of the disk persists, the stretched nerve fibers show moniliform swellings. Finally cystoid bodies are formed, which undergo disintegration. The neuroglial cells at the crest of the swelling proliferate, and if these degenerative and proliferative processes proceed, no relief of pressure will benefit vision. Indeed, cicatricial contraction may cause further visual failure after pressure is removed. The visual loss due to direct pressure on the nerve intracranially may recover if operation is done before much pressure atrophy has taken place. Visual loss due to degenerative changes at the disk probably will be progressive even after

operation. Delay of palliative operation is justifiable only so long as the papillœdema remains in the first stage, without any visual loss or secondary disk changes. With regard to papillœdema and its value in location of the tumor, Paton says that in too many cases it first shows itself or is more strongly marked in the contralateral eye to be a sign of any value in localization of the tumor. Descending atrophy in one eye with papillitis in the other indicates tumor on the side of atrophy.

CURRAN.

In ORMOND'S (10, **Two cases of permanent hemianopsia following severe attacks of migraine**) first case, the patient (*æt.* 33, female) has been for more than ten years subject to migraine of a severe kind. During these attacks neither scotoma nor hemianopsia was noticed. After an unusually severe attack of migraine lasting three or four days, in which the photophobia was extreme, she noticed she could see nothing on the right side. When examined, the defect in the right field of vision was not absolute. She was conscious of light when a very strong electric globe was placed on that side. She was seen four months afterwards, and this condition was unaltered.

In the second case (*æt.* 32, female), the patient also had suffered for years from bilious headaches, and after a severe attack, on running to catch a train, noticed that she could see nothing on her left side. This condition remained permanent.

Ormond accounts for these and similar conditions on the theory that migraine is due to a spasm of the arteries, and that in these cases presumably a greater or more prolonged spasm has taken place, resulting in permanent injury to the visual cortex.

CURRAN.

III.—GENERAL AND EXPERIMENTAL PATHOLOGY AND TREATMENT.

18. BERNHEIMER. **Tuberculin treatment of patients with diseases of the eye.** *Eighty-fifth Meeting of the German Naturalists and Physicians*, Vienna.

19. DUVERGER. **Action of zinc sulphate in subacute diplobacillus conjunctivitis.** *Annales d'oculistique*, cl., p. 161.

20. FUCHS, A. **Anaphylactic uveitis.** *Versamml. deutsche Naturf. u. Aerzte*, Vienna, September 21.

21. LOEWENSTEIN. **Experimental studies concerning the regeneration of the epithelium of the cornea.** *Archiv f. Ophthalm.*, lxxxv., p. 221.

22. SALUS. **Infection and natural immunity of the vitreous.** *Eighty-fifth Meeting of the German Naturalists and Physicians*, Vienna, Sept. 21.

23. SCHANZ. **Light therapy of eye diseases.** *Klin. Monatsbl. fuer Augenheilkunde*, p. 416.

24. VERREY-WESTPHAL. **Studies of the action of the salts of zinc in diplobacillus conjunctivitis.** *Annales d'oculistique*, cl., p. 165.

25. WEEKERS. **Experimental studies of thermotherapy of progressive ulcers of the cornea.** *Soc. belge d'ophtalm.*, August, 2–3.

26. WESSELY. **The nature of action of eserine.** *Zentralblatt f. prakt. Augenheilkunde*, p. 303.

LOEWENSTEIN (21, **Regeneration of the corneal epithelium**) finds from his experiments on rabbits that the regeneration of the corneal epithelium advances more rapidly at the limbus than in the center of the cornea, and that neither the conjunctival vessels, nor the branches supplying the muscles have an influence upon the regeneration, while the section of all the ciliary vessels delays the covering of the epithelial defect until the vessels from the conjunctiva assume the work of furnishing nutrition to the cornea. The regeneration of epithelium is not influenced by section of the trigeminus or excision of the cervical sympathetic. It is accelerated by slight inflammatory irritations, as well as by persistent reduction of the tension of the eye.

WESSELY (26, **Action of eserine**) observed one of the rare cases of glaucoma in which eserine had a rapidly bad effect, associated with a great increase of tension. By graphic registration of the intraocular tension in curarized rabbits, he found that about fifteen minutes after an instillation of eserine a not inconsiderable increase of tension set in, which after thirty minutes fell rather sharply, so that the tension became normal in about a minute. This increase of tension was due to a hyperæmia of the iris and ciliary body, as shown by an increased excretion of albumin and fluorescin into the aqueous. In favor of this theory that eserine produces an internal hyperæmia is the observation that after a subcutaneous introduction of a 5% solution of calcium chlorate a considerably less quantity of albumin is to be found in the aqueous of the eserinized eye. The reason he gives why the increase of tension from the hyperæmia induced by eserine is not more often observed in the therapeutic use of this drug in glaucoma is that this is more than compensated for, as a rule, by the

opening of the sinus of the anterior chamber consequent upon the meiosis.

SALUS (*22*, **Infection and natural immunity of the vitreous**) first investigated the part taken by the vitreous in serum and leucocyte immunity, and found it to be equally extensive as that of the aqueous. He inoculated simultaneously a number of rabbits' eyes with equal quantities of the same germs in the vitreous, and enucleated the eyes for examination after various intervals, usually two, four, six, or twelve hours. A decrease in the number of germs took place as soon as they were introduced into the vitreous, which was to be ascribed to their death in consequence of the change of nutritive medium, and might result in the death of all of them when they had a very slight power of resistance and were in small numbers. After this phase comes a stage of increase for all germs, and when this has reached a certain height, which differs for different germs, the interposition of serum and leucocyte protective material begins. Three types of bacteria may be broadly differentiated according to their behavior in the eye. Type 1 is characterized by a very slight power of resistance, slow increase, quick appearance of a very efficient protective power, and death of the germs on the average in forty-eight hours; Type 2, by an enormous power of resistance, extremely quick increase, a very marked chemotactic action and therefore a violent inundation of leucocytes, and death of the germs in about six days on the average; Type 3, by a fairly strong power of resistance and rapid increase of the germs, but the protective material proves of little or no efficiency, so that suppuration gradually develops. The number of germs remains for several days at an almost constant height, until the final result is either death of the germs, perforation of the eyeball, or general sepsis. The cause of this is not that the protective material is too weak, but that it arrives too late; while in other parts of the body the entering germs meet with the protective material almost immediately, in the vitreous the interval between the introduction of the germs and the arrival of the immune bodies is considerable, at least five or six hours. The action of the germs in the eye depends chiefly on their power of resistance, the rapidity with which they increase, and the strength of their chemotactic action. KOELLNER.

FUCHS (20, **Anaphylactic uveitis**) reports experiments made together with Meller to determine whether there is a local anaphylaxis of the eye, whether this anaphylactic inflammation possesses its own peculiar histological character, and whether sympathetic inflammation is to be looked upon as anaphylactic from the standpoint of histology and serology. He finds that the rabbit's eye reacts with signs of inflammation to an injection of autogenous serum. The reaction to the primary intraocular injection of heterogenous serum varies greatly; its onset may be very severe and on the same day, or it may be very slight. Injections of serum taken from patients suffering from sympathetic ophthalmia generally excited more severe symptoms. A sensibilization from the eye is possible with fair regularity, and a local reaction in the sensibilized eye is produced by intravenous injection. In monkeys the injection of vitreous taken from eyes enucleated for sympathetic ophthalmia and mixed with serum and blood caused severe symptoms, but he was unable to excite local or general symptoms of anaphylaxis by the intravenous reinjection of serum from such patients, or from healthy persons. He considers an anaphylactic ætiology of sympathetic ophthalmia to be very improbable from the standpoint of serology, as he has not yet been able to obtain a free anaphylactic antibody circulating in the blood, and he has not been able to demonstrate an antibody by complement fixation or by the precipitin method.

KOELLNER.

VERREY–WESTPHAL (24, **Zinc in diplobacillus conjunctivitis**) confirm the well-known fact that zinc has no bactericide power, and ascribe the result of its instillation to its astringent power upon the conjunctiva, by which the superficial epithelial cells are cast off with the bacilli, and are washed away by the tears. They studied the action of zinc sulphate, acetate, permanganate, and lactate, and find the sulphate to be the best.

CAUSÉ.

DUVERGER (19, **Zinc sulphate in subacute diplobacillus conjunctivitis**) studied the action of zinc sulphate in these cases in three different experimental methods. First he brought the diplobacilli in contact with a solution of zinc for from ten seconds to ten minutes, and then transferred them to nutritive media, where they grew, showing that zinc does not

kill the bacilli in vitro. In the second series of experiments a solution of zinc was added to the serum and it was found that in a certain concentration the solution of zinc prevented the development of the bacilli. The action of the drug is increased by coagulated serum, yet a third series of experiments showed that a mixture of zinc with blood serum produced no different an effect than the pure solution of zinc.

CAUSÉ.

In ulcers of the cornea, deep infiltrates, interstitial keratitis, and eczema of the lid, SCHANZ (23, **Light therapy of eye diseases** has seen good results from the use of light very rich in short-waved rays, those having a wave-length of from 390 to 290 microns, concentrated upon the eye with a lens. The effect is increased if the tissue is sensibilized for light with fluorescin.

WEEKERS (25, **Thermotherapy of progressive ulcers of the cornea**) holds the point of a galvanic cautery for a minute close to the ulcer, especially over its progressive wall, moving it back and forth, but not touching the cornea. The temperature should be controlled by a thermometer and not be over 50° C.

For a number of years, BERNHEIMER (18, **Tuberculin treatment of patients with diseases of the eye**) has directed his attention principally to those diseases of the eye in persons who were tuberculous, or in whom tuberculosis was suspected. In the course of six years he has treated 425 patients repeatedly with tuberculin. First he speaks of patients who had a marked scrofulous diathesis, and it is notable that a beneficial influence can be obtained visibly from tuberculin in such cases when complicated with suppurating glands, due to a mixed infection of streptococci and staphylococci, only after the sources of pus have been removed, either through medicamental treatment or operation. This is an important fact which must be taken into account in the treatment of such cases. The action of tuberculin was very good in those cases of interstitial keratitis in which no hereditary syphilis could be demonstrated, between 8 and 10% of the 300 cases observed. These cases differ in no way clinically from those due to hereditary syphilis, and in many of the latter the tuberculin reaction was positive. It is then very advantageous to supplement

the antisyphilitic treatment with tuberculin, and to repeat the two forms of treatment at suitable intervals. The other cases were ones of chronic iritis, iridocyclitis, and disseminated choroiditis, in which syphilis and other demonstrable ætiological factors could be excluded, and in which the blood and urine were normal. The history, internal condition, or the findings by the X-rays almost always revealed other signs of a tuberculous constitution. Aside from the favorable momentary influence exerted on all these patients by tuberculin, it has been shown in the course of twelve years that the recurrences after thorough, repeated tuberculin treatment falls from 50% to scarcely 20%. KOELLNER.

IV.—METHODS OF RESEARCH, REMEDIES, INSTRUMENTS, AND GENERAL OPERATIVE TECHNIQUE.

27. ALLPORT, FRANK. **Cacodylate of sodium in a case of keratoiritis due to lime-burn.** *Ophthalmic Record*, Sept., 1913.

28. DUTOIT. **Therapeutic experiences with lipoiodin in some diseases of the optic nerve and retina.** *Zeitschr. f. Augenheilkunde*, July, 1913, p. 24.

29. ELSCHNIG. **Asepsis of the hands.** *Klin. Monatsbl. f. Augenheilkunde*, June, 1913, p. 793.

30. FREYTAG. **Noviform in ophthalmology.** *Berlin klin. Wochenschrift*, p. 1261.

31. GRADLE, H. S. **New scleral trephine.** *Jour. A. M. A.*, June 28, 1913.

32. KOSTER. **Treatment of eye diseases with radium and mesothorium.** *International Medical Congress*, London.

33. MEDING, C. B. **Subconjunctival injections of cyanide of mercury in ophthalmology.** *Ophthalmology*, July, 1913.

34. POSSEK. **Sterilization of cutting instruments with alcohol.** *Eighty-fifth Meeting of the German Naturalists and Physicians*, Vienna, Sept. 21.

35. TERSON, A. **Sterilization of the ophthalmologist's hands before operations and in daily practice.** *Annal. d'oculistique*, cl., p. 92.

36. TUERK. **A new cystitome.** *Klin. Monatsbl. f. Augenh.*, June, p. 826.

MEDING (33, **Subconjunctival injections of cyanide of mercury in ophthalmology**) was favorably impressed with this method, which he saw used extensively in India. He urges its use especially in infected corneal ulcerations, pannus, and recent corneal opacities. The cyanide is less irritating than the bichloride, does not affect instruments, and is as

potent. Care should be taken not to enter Tenon's capsule, and not to inject too much in one place.

ALLING.

ALLPORT (27, **Cacodylate of sodium in keratoiritis due to lime-burn**) thinks that his case, in which the cornea was completely opaque, would not have recovered entirely without the use of seven injections of sodium cacodylate. Two or three days after the first injection the clearing process began. The routine treatment was also carried on.

ALLING.

FREYTAG (30, **Noviform in ophthalmology**) reports his experience with noviform in the Leipsic eye clinic, which were essentially good. No harmful effects were observed. Noviform is odorless, does not irritate the skin or the mucous membranes, and produces no symptoms of intoxication. It was found to be of at least equal value with xeroform in the treatment of erosions and ulcers of the cornea, herpes corneæ, interstitial keratitis, episcleritis, and after operations on the lids and lacrimal sac.

DUTOIT'S (28, **Therapeutic experiences with lipoiodin**) experiments concerning the therapeutic advantages of lipoiodin in diseases of the optic nerve and retina start from the established fact, that iodine given in the form of potassic iodide is not laid up in the fat, bones, brain, and spinal cord, as it is in the other tissues of the body, while this can be brought about by iodine in combination with lipoid soluble bodies. Such a neurotropic combination of iodine is lipoiodin. He obtained good results in three cases of monolateral syphilitic optic neuritis, three of optic neuritis following influenza, and in single cases of uroarthritic and diabetic optic neuritis, and of senile degeneration of the macula.

According to KOSTER (32, **Treatment of eye diseases with radium and mesothorium**), this form of treatment gives good results without danger in many diseases of the eye. He uses radium and mesothorium bromide in glass tubes laid directly on the part to be treated. In this way he has dealt with keratitis, iritis, scleritis, choroiditis, retinitis pigmentosa, some forms of cataract, detachment of the retina, lupus, angioma, neuralgia, etc.

GRADLE (31, **New scleral trephine**) has devised an instru-

ment which keeps the trephine steady while entering the sclera. The trephine is screwed to the end of a shaft which revolves freely in a solid housing held firmly in the hand. By turning the knurled end of a flexible shaft the trephine is rotated through a ratchet and pinion. ALLING.

TUERK (36, **New cystitome**) recommends a cystitome with a bellying edge so that it will cut through the capsule instead of tearing it.

ELSCHNIG (29, **Asepsis of the hands**) recommends the wearing of rubber gloves by surgeons, except during intrabulbar operations.

TERSON (35, **Sterilization of the hands**) considers sterilization with alcohol to be the best preparation of the hands before operation. For this purpose he uses a 90% alcohol with 1 to 1000 iodine added, with which he rubs his hands for five minutes. The hands should not have been previously washed. He also recommends to dip the hands in alcohol between patients in daily practice, as it cleanses and sterilizes them better than soap and water. The use of rubber gloves in ophthalmology is not satisfactory. CAUSÉ.

POSSEK (34, **Sterilization of instruments**) confirms the statement of Bayer that 70% alcohol is the best solution for this purpose. He found that infected instruments were sterilized most quickly by 70% alcohol, sooner than by absolute alcohol. The instruments should lie for an hour or two in 70% alcohol, which is then poured off and replaced by absolute alcohol. They can then remain as long a time as may be desired perfectly sterile, without harm to the edge. KOELLNER.

V.—ANATOMY, EMBRYOLOGY, MALFORMATIONS.

37. FELIX, C. H. **A rare congenital anomaly of the iris.** *Nederl. Tijdschr. voor Geneeskunde*, 1913, ii., No. 2.

38. HOLLOWAY, T. B. **Complete bilateral aniridia. Ectopia lentis. Pathological cupping of the disks.** *Ophthalmic Record*, Sept., 1913.

39. LEPLAT. **Description of a human cyclopean fetus.** *Arch. d'ophtalm.*, xxxiii., p. 469.

40. RUEBEL, E. **Congenital hypoplasia or aplasia of the anterior layer of the iris.** *Klin. Monatsbl. f. Augenheilkunde*, August, 1913, p. 174.

41. WAARDENBURG, P. J. **Heredity of physiological and pathological characteristics of human eyes.** *Inaug. Dissert.*, Utrecht, 1913.

HOLLOWAY'S (38, **Complete bilateral aniridia**) cases showed, besides complete absence of the iris, a horizontal nystagmus, dislocation of the lens upward, and a marked cupping of the disks, but no congenital defect elsewhere in the body. Although there was no increase in the intraocular tension there undoubtedly is a tendency to glaucoma in these cases. The iris is represented by a rudimentary stump, adhesions may be present, and the ligamentum pectinatum is infrequently badly developed. These facts, as well as the dislocation of the lens, might tend to block the iris angle and cause increase of tension.

ALLING.

WAARDENBURG'S (41, **Hereditary physiological and pathological characteristics of human eyes**) researches dealt with the question of the applicability of Mendel's rules for heredity of the pigmentation of the eye, of errors of refraction, and of family optic atrophy. He also considered the influence of consanguinity. He concludes that total albinism is a rare condition due to heredity, which is not connected with errors of refraction; that consanguinity may be its precursor, and that both sexes are equally affected; as regards the pigmentation of the iris, that the ectodermal pigmentation may be thus referred, but not the ectodermal plus the mesodermal; that dark irides are usually dominant, and that there are many independent types of mesodermal pigmentation of the iris. Regarding errors of refraction he thinks that high hypermetropia may be referred to heredity, over which emmetropia dominates, just as the normal curvature of the cornea dominates over astigmatism that may be hereditary. The latter and hypermetropia are independent of each other so far as heredity is concerned. VISSER.

FELIX (37, **Rare congenital anomaly of the iris**) found in a deaf-and-dumb boy two atypical, little marginal colobomata, and nine irregular, radiating defects in the stroma of the left iris, polycoria. In both eyes there was a brown discoloration and thinning of the stroma in the entire periphery of the iris, while the pupillary part was normal. He could find no mention of such colobomata in literature.

VISSER.

LEPLAT (39, **Human cyclopean fetus**) gives the anatomical description of a cyclopean human fetus, six months old, in

which the only sign of a double rudiment was the presence of two lenses. The cyclopean eye was microphthalmic, had no cornea or iris, and had a coloboma of the ciliary body and of the choroid. Both lenses, of which one was considerably larger than the other, were enclosed in a complete capsule; the tunica vascularis of each was independent of the other. The larger lens showed a secondary malformation in that the characteristic picture at the equator of epithelial cells growing out into fibers was repeated six times in other places. Leplat distinguishes three forms of cyclopia, with transition forms between them.

CAUSÉ.

RUEBEL (40, **Congenital hypoplasia or aplasia of the anterior layer of the iris**) reports a case in which the brown iris proved to be transparent on transillumination with Sachs's lamp. He uses the fact of this transparency of a brown iris, therefore of a normal pigment layer with aplasia of the anterior layer of the iris, to support his theory that the transparency of the iris is really dependent on the condition of the anterior layer of the iris and not on its pigment layer. The extremely active play of the pupil in this patient speaks against Muench's theory, that the dilatator action is obstructed in the pigment-holding stroma cells of the iris.

VI.—NUTRITION AND INTRAOCULAR TENSION.

42. HERTEL. **Changes of the eye tension through osmotic processes.** *Klinische Monatsblaetter fuer Augenheilkunde*, September, 1913, p. 351.

43. KLEIN, S. **Clinical contribution to the study of the current direction and absorption of the contents of the anterior chamber.** *Eighty-fifth Meeting of the German Naturalists and Physicians*, Vienna, Sept. 21.

KLEIN (43, **Direction of the current and absorption in the anterior chamber**) observed in a patient that had been operated on for cataract a blood clot that filled the pupil; 36 hours later the clot had become loosened, diminished in size, and displaced in front of the iris. At the end of twelve hours more it had moved farther to the temporal side in front of the iris, and another twelve hours later it lay entirely in the sinus of the chamber. Ninety-six hours after the operation it had disappeared. In like manner he saw in several cases of dis-

cission of the lens minute particles of lens substance move gradually from the pupil to the sinus of the anterior chamber, where they disappeared. In one case of tuberculosis of the iris gray nodules occupied the central portion of Descemet's membrane, which after a while formed a circle about the place where they had been situated, and later formed a circle near the sinus, leaving the place they had occupied bare, and these nodules were evidently the same that had formerly occupied the center. Klein concludes from these observations that all of these objects were floated by the current of aqueous from their original locations to the sinus of the chamber, and therefore that the current of the aqueous has a centrifugal direction, which is a confirmation of Leber's theory. These observations tell us nothing as to the origin of the aqueous, whether it comes from the vessels of the ciliary body or iris, and whether from the anterior or posterior surface of the iris; they simply indicate that the flow is toward the angle. The idea of the absorption of pathological products from the anterior chamber is that these objects are washed by the current of aqueous into the sinus and pass through it. By what power they are enabled to pass will be dealt with in a future paper.

KOELLNER.

HERTEL (42, **Changes of tension through osmotic processes**) finds that intravenous injections of glucose and sodium salts, as well as of urea and gelatine, produce in rabbits a very great fall in the tension of the eye by the abstraction of water. The loss of water was determined by weighing the eye, and at the same time chemical analysis revealed the injected substances within the eye. The blood pressure was usually unchanged, and the fall of tension took place when the circulation was totally inhibited, therefore the loss of water must have been due wholly to osmosis. Correspondingly, the decrease of tension is only transient. It took place in eyes with artificial glaucoma, and in human eyes with glaucoma. Hertel was able to transiently reduce the tension to subnormal by an intravenous injection of 250*ccm* of a 10% solution of salt. By an experiment on himself he obtained a great diminution of tension by the ingestion of perhaps the same amount of salt by mouth. To what extent the result of these experiments may be utilized in practice he does not say.

VII.—THE SENSE OF SIGHT.

44. FERGUS. **Eyesight and navigation.** *Ophthalmic Review*, xxxii., p. 231.

In a very interesting discussion of the various tests to be passed by candidates in navigation, FERGUS (44, **Eyesight and navigation**) makes clear the following points: A man failing when examined by Holmgren's wools may have perfect color vision. In support of this he quotes the fact that of 240 candidates who failed to pass this test, 87 passed more stringent tests. However, if a man passes Holmgren's test he is not color blind. Fergus says that he prefers the lamp test and considers that so long as the candidate can immediately and infallibly distinguish the white light, the green light, and the red light used in navigation, he is safe. He pleads for better standardization of the colors and luminosities of the side lights of ships, especially of the green. At present too much emphasis is put on visual acuity and not sufficient on the form sense. He considers form sense very important for safety.

CURRAN.

VIII.—ACCOMMODATION AND REFRACTION.

45. FARNARIER. **Two cases of paralysis of the accommodation; one with paralytic mydriasis, the other with paralysis of the convergence, following latent diphtheria.** *La clinique ophtalm.*, xix., p. 489.

46. LAMBERT, W. E. **The surgical treatment of high myopia.** *Ophthalmology*, July, 1913.

47. MARQUEZ. **Diagnosis of biastigmatism and its treatment with bicylindrical glasses with oblique axes.** *International Medical Congress* at London, September, 1913.

48. MAWAS. **Anatomy and physiology of the accommodation of the eye.** *Annales d'oculistique*, cl., p. 182.

LAMBERT (46, **Surgical treatment of high myopia**) adds five successful cases to his list already published. He is strengthened in his conviction that the dangers of the operation have been greatly exaggerated. He uses the Fukala method in young subjects, but in older cases, where lenticular changes have begun, he makes a preliminary iridectomy followed by preliminary capsulotomy and extraction.

ALLING.

MAWAS (48, **Anatomy and physiology of the accommodation**

of the eye) finds that the ciliary muscle gives the ciliary body its triangular appearance; its fibers mainly run longitudinally, parallel to the inner surface of the sclera, some going to and beyond the ora serrata. In many eyes oblique fibers also are to be seen, but he has never found a truly circular fiber in a human eye. The muscle has no tendon in the true sense of the word. In its action it diminishes the surface of the ciliary body, draws the ligamentum pectinatum and ora serrata toward each other, relaxes the posterior and renders tense the anterior portion of the fibers of the zonula. Those coming from the non-pigmented layer of ciliary epithelium from the ora serrata to the angle of the iris are therefore of a purely epithelial and neuroglial nature. The ciliary muscle and zonula are separated not only by the double epithelial layer of the ciliary retina, but also by a considerable cushion of connective tissue, which, containing numerous elastic fibers, distributes itself within the muscle. The ciliary muscle hence acts only indirectly upon the epithelium and zonula through this connective tissue. From measurements taken in various mammals Mawas finds an anatomical and physiological asymmetry of the ciliary body which, during an everywhere even contraction of the ciliary muscle, results in an uneven curvature of the lens, a considerable correction of corneal astigmatism. The shortening of the ciliary region by the contraction of the muscle results mainly in stretching backward and outward the strong anterior fibers of the zonula, which is the principal means of changing the form of the lens in accommodation. Not only in hydrophthalmos but also in chronic glaucoma, intraocular tumors, and certain forms of iridocyclitis he observed an enlargement, "frequently considerable," of the eyeball, and an increase of the distance between the lens and the ciliary circle. The tension thus produced on the anterior fibers of the zonula results in a flattening of the peripheral, and a greater curvature of the entire anterior surface of the lens. The region of the nucleus can change during accommodation. The posterior surface of the lens changes the same as the anterior; in many cases the increase of its curvature is just as great. CAUSÉ.

FARNARIER (45, **Diphtheritic paralysis of the accommodation**) reports two unusual cases of this nature. The first was

a woman 25 years old, who had in addition to the paresis of the accommodation a paresis of the sphincter pupillæ—in other words, a complete internal ophthalmoplegia. The other, an officer 29 years old, had a paralysis of convergence develop during the accommodative paresis. He had to retire from service as the condition did not improve. A remarkable point is that the diphtheria was latent in both cases until the appearance of the eye symptoms. CAUSÉ.

In addition to the ordinary corneal astigmatism there are cases that have lenticular and fundus astigmatism. According to MARQUEZ (47, **Diagnosis of biastigmatism and its treatment**), the principal meridians of the corneal and of the other astigmatism may cross at an oblique angle. This he calls biastigmatism. (Theoretically there may be also a triastigmatism.) To correct this he first determines the corneal astigmatism with the ophthalmometer, and completes the subjective test with radiating lines. To correct a biastigmatism two cylindrical glasses are necessary, with their axes inclined toward each other. If a spherical correction also is needed the combination has to be reduced to a sphero-cylindrical glass.

IX.—THE MOTOR APPARATUS OF THE EYES.

49. AUBINEAU and LENOBLE. **Myoclonic nystagmus.** *Archives d'ophtalmol.*, xxxiii., p. 503.

50. COPPEZ. **Nystagmus.** *Ibid.*, xxxiii., p. 545.

51. IGERSHEIMER. **Nystagmus in hereditary syphilis.** *Verein der Aerzte in Halle*, July 2, 1913.

52. LEVINSOHN. **The optical winking reflex.** *International Medical Congress* in London, September, 1913.

53. TERTSCH. **Congenital ophthalmoplegia externa without ptosis.** *Eighty-fifth Meeting of the German Naturalists and Physicians*, Vienna, Sept. 21.

54. VON GROSZ. **Treatment of strabismus.** *Société belge d'ophtalm.*, August, 1913.

According to LEVINSOHN (52, **The optical winking reflex**) the first degree of a movement to close the lids is a slight twitching of the lower lid, usually in its median half and visible only in the skin. This twitching does not always appear in response to weak stimuli; it is excited more readily by the approach of an object than by diffuse dazzling. As a rule,

this reflex is wearied very easily. Stronger optical stimuli, which are associated with a feeling of discomfort, cause either a winking movement of the upper lid, or a more or less marked closure of the lids. The reflex when excited by the approach of a body always takes place by way of the cortex, while the closure of the lids to diffuse illumination is sometimes excited in man after exclusion of the central organ of vision. In no case is the winking reflex in diffuse illumination diagnostic of the presence of vision.

AUBINEAU and LENOBLE (49, **Myoclonic nystagmus**) describe the pathogenesis and clinical symptoms of what was formerly termed essential, but is now known as myoclonic, nystagmus. It is a congenital and family anomaly, readily distinguished from other forms of nystagmus. The twitchings are of an undulatory character. They are not confined to the muscles of the eyes, but may affect those of the lid, face, neck, and arm. The reflexes are often increased, and vasomotor disturbances are frequently present, while the sensibility is commonly normal. Usually some signs of degeneration are to be found. Pathogenetically the myoclonia is possibly a consequence of cortical changes, and the only manifest sign may be the nystagmus. CAUSÉ.

COPPEZ (50, **Nystagmus**) deals with the pathogenesis of nystagmus. In the twitchings, in which a rapid and a slow phase are differentiated, the tonic association center and the rhythmic center, together with the vestibular nerve and its nuclear region, play the most important part. The vestibular is the tonic nerve for all the muscles of the body. After its section the tone of the opposite side of the body is impaired, the head rotates to the side of the injured nerve, and an animal rotates about its own axis. If the animal survives the destruction of the nerve, two weeks later its head is rotated toward the injured side. The eyes rotate in like manner to the rest of the body, when anatomical conditions permit. In the course of their rotation the eyeballs are soon arrested and return to their original position to begin the rotation anew. Therefore vestibular nystagmus is only a conjugate deviation in constant movement, a kinetic deviation. The slow phase of vestibular nystagmus is the initial movement, and graphically shows inhibitions, or even retrograde movements; the

rapid phase has no interruptions. The slow phase is produced by the contraction of the two lateral muscles and the relaxation of their antagonists. The vestibular stimulation goes to the tonic association center, which distributes it to the muscles of the eyes. This takes place probably in the level of von Monakow's heap of cells in the neighborhood of the nucleus of the abducens. The rapid phase originates probably in the muscle itself through the mediation of the rhythmic center of co-ordination. These two centers act and react upon each other; the increased function of the one causes a transient paresis of the other, followed by just as intense a function which persists longer than that of the first. Not only vestibular stimulation, but also impressions from the cortex, the will, the retina, and the ear, act upon these centers, all of which are co-ordinated and subordinated. The balance of the eye muscles depends on this. If one of these factors is at fault, the harmony between the association centers of the two sides is impaired, and there arise conjugate deviation and perhaps nystagmus. Finally the cerebellum has an important part; it does not act directly upon the association centers, but through the vestibular nucleus, the activity of which it quantitatively regulates. The vestibular nucleus is to a certain degree a little accessory cerebellum. Undulatory nystagmus arises from the rhythmic association centers, which under other conditions act with the tonic centers; the eyes then vibrate regularly. Miner's nystagmus is a type of this variety. The rhythmic centers functionate because the motor apparatus of the eyes is tired. The nervous stimulus no longer brings about a permanent muscular contraction; the muscular overstimulation, which goes with the weariness, communicates itself to the rhythmic centers, and we have an incomplete tetanus.

CAUSÉ.

IGERSHEIMER (51, **Nystagmus in hereditary syphilis**) has met with nine cases of nystagmus in hereditary syphilis. In six the fundus was normal, in three a specific choroiditis was present, but its relation to the nystagmus was doubtful. The nystagmus usually was congenital and was often associated with an oblique position and a nodding of the head. There were no gross disturbances of vision. In the larger children, in whom the vision could be tested, it varied from $\frac{5}{10}$ to $\frac{5}{5}$.

The light sense also was apparently unharmed. Antisyphilitic treatment was promptly effective.

In the treatment of strabismus v. GROSZ (54, **Treatment of strabismus**) recommends to begin with the instillation of atropine alternately in each eye in early childhood; then, as soon as intelligence permits, to correct the refraction and institute stereoscopic exercises. No operation should be performed until this treatment has proved of no avail.

DANIS.

TERTSCH (53, **Congenital ophthalmoplegia externa without ptosis**) had a patient 7 years old, whose right eye was normal except for 10 D of myopia. The left eye was of normal size and absolutely immovable. It had a myopia of 5 D, with normal accommodation and pupillary reactions. The right palpebral fissure was 9*mm* broad, the left 6*mm*, because of enophthalmos. The notable point about the case was the absence of ptosis. The cause of the ophthalmoplegia seemed to be a congenital aplasia of the extrinsic muscles.

X.—LIDS.

55. BONDI. **A clinical symptom of hordeolum externum that has been little observed.** *Medizinisches Klinik*, xxvii., p. 1079.

56. ESPINOUZE. **Operation for ectropion of the lower lid after enucleation.** *Revue générale d'ophtalmologie*, xxxii., p. 289.

57. LOEWENSTEIN. **Chalazion and the inflammatory tumor of the lid.** *Eighty-fifth Meeting of the German Naturalists and Physicians*, Vienna, Sept. 21.

58. MACCALLAN. **An operation for ectropion of the lower lid.** *Ophthalmoscope*, xi., p. 538.

BONDI (55, **A clinical symptom of hordeolum**) calls attention to the swelling of the preauricular gland, which he has observed in each of 124 successive cases of hordeolum externum.

LOEWENSTEIN (57, **Chalazion**) finds within a dense mass of plasma cells a regular concentric arrangement of polymorphonucleated leucocytes, surrounded by a circle of epitheloid cells which become slender and spindle-shaped toward the outer limits of the ring. In the center there is often an open space, which he takes to be the product of the proteolytic ferments of the polymorphonucleated leucocytes. Chalazia rich in connective tissue represent a transition form to the inflammatory tumor of the lid, which developed in his case

after the extirpation of a chalazion and closely resembled histologically a chalazion with hyperplasia of connective tissue. Chalazion tissue in the anterior chamber of guinea-pigs and rabbits was absorbed without any consequences. Other experiments were likewise negative in results. The Giemsa stain gave no positive ætiological result. He mentions the possibility of an anaphylactic cause of chalazion from the absorption of glandular tissue, and considers the inflammatory tumor of the lid to be a hyperplasia of connective tissue like a keloid. KOELLNER.

In ectropion of the lower lid, such as follows trachoma, MACCALLAN (58, **Operation for ectropion of the lower lid**) removes the tarsus and forms a new fornix. A horizontal incision is made 5 or 6*mm* from the margin of the lid. At each extremity this is carried to the inner and outer canthus, stopping at 1 or 2*mm* from the lid margin. The conjunctiva is dissected from the subjacent fuscin and cartilage. The latter, with some of the redundant conjunctiva, is removed with scissors. A threaded needle is entered from the skin surface 5*mm* below the lashes, passed through the tissue of the lid and through the anterior edge of the conjunctiva, then forward through the posterior lid, coming out near the point of entrance. Three such sutures are inserted and tied loosely. CURRAN.

ESPINOUZE (56, **Operation for ectropion of the lower lid after enucleation**) splits the lid into the two laminæ, the anterior one containing the skin and orbicularis, the posterior the tarsus and conjunctiva. The anterior lamina is then drawn over the posterior and secured with sutures. To prevent the formation of an entropion a pedicled flap is taken from the skin of the lid and applied to the posterior surface of the anterior lamina. He reports four cases treated in this way. CAUSÉ.

XI.—LACRIMAL ORGANS.

59. BLUM. **The course of the secretory fibers to the lacrimal gland and that of the gustatory fibers.** *Deutsche med. Wochenschr.*, xxxiii., p. 1588.

60. IGERSHEIMER. **Diseases of the lacrimal passages and syphilis.** *Muenchener med. Wochenschrift*, xxxvi., p. 2025.

61. SANTO-FERNANDEZ, JUAN. **Two cases of lacrimal cysts.** *Ophthalmology*, July, 1913.

BLUM (59, **Course of the secretory fibers to the lacrimal gland**) shows from the clinical observation of a case that the secretory fibers that supply the lacrimal gland do not come from the trigeminal, but from the facial nerve. They pass from the geniculate ganglion through the major superficial petrosal nerve to the sphenopalatine ganglion, and then to the gland with the zygomatic nerve, in common with the sensory lacrimal nerve. The case also showed that the gustatory fibers likewise separate from the facial nerve in the geniculate ganglion, and then pass via the major or minor superficial petrosal nerve to the second or third branch of the trigeminus.

In one of the cases described by SANTO-FERNANDEZ (61, **Lacrimal cysts**) there was a small tumor the size of a pea at the margin of the upper lid near the punctum. It had increased in size during the past three years, but had been present for forty years. The canaliculus was patent, but when dilated and pressure was made over the tumor the contents, which looked like sebaceous material, were expelled. The cyst did not return. The other case was very similar, but had existed for only a year. ALLING.

IGERSHEIMER (60, **Diseases of the lacrimal passages and syphilis**) speaks of the ætiology of diseases of the lacrimal passages especially in childhood. Only seven out of twenty-three cases were without symptoms of hereditary syphilis. Nine had rhinological trouble, which was specific in five. In three cases the extirpated sac showed no specific changes. Hence syphilis is frequently the cause of blennorrhea of the lacrimal sac in children, though it is rarely so in adults.

XII.—ORBITS, INCLUDING EXOPHTHALMOS, ACCESSORY SINUSES.

62. FISCHER. **New relations between the nose and the eye.** *Eighty-fifth Meeting of German Naturalists and Physicians*, Vienna, September 21.

63. MUNCASTER, S. B. **Orbital cellulitis caused by the staphylococcus.** *Ophthalmic Record*, August, 1913.

64. POSEY. **Two unusual orbital conditions.** *Ophthalmoscope*, xi., p. 466.

65. RUEBEL. **Ophthalmoscopic condition in a case of pulsating exophthalmos.** *Klin. Monatsbl. f. Augenheilkunde*, July, 1913, p. 62.

66. STRUYCHEN, H. J. L. **Empyema of the accessory sinuses with disturbances of the eye.** *Nederl. Tijdschrift voor Geneeskunde*, ii., No. 6.

RUEBEL (65, **Ophthalmoscopic condition in a case of pulsating exophthalmos**) found in a young man who exhibited the typical picture of post-traumatic pulsating exophthalmos, a peculiar anomaly in the fundus which was of particular importance as it was present before the operation, but disappeared completely after ligation of the common carotid. It consisted of numerous bright yellow spots, scattered over the entire fundus, that were situated in the retina and were in relation to the greatly engorged veins.

MUNCASTER (63, **Orbital cellulitis caused by the staphylococcus**) observed a case of septicæmia from an abscess in the forehead associated with orbital cellulitis. A few days later another abscess formed on the side of the head, involving nearly one-half of the scalp. An incision was made into the orbit through the upper lid and pus evacuated. The cornea ulcerated and ruptured. The patient had all the symptoms of septicæmia. Staphylococcic vaccines were employed and the boy finally recovered. ALLING.

POSEY (64, **Two unusual orbital conditions**) reports a case of chronic inflammatory tumor, 3*cm* by 1*cm* in size, with cyst and giant-cell formation, following false passages made by lacrimal probes. The tumor contained numerous foreign-body giant-cells, and occasionally large giant-cells. The walls of the blood-vessels were not altered, and there was no proliferation of endothelium. There was no capsule. He considers the condition to have been a tissue reaction to foreign body irritation. In his second case a large lacrimal mucocele was occasioned by pressure exerted by the distended walls of the anterior ethmoid cells in consequence of a retention of mucus in one of them. The sac had been extirpated a year previously by Meller's method. A swelling in the region of the sac followed an attack of influenza. On operation the large mucocele was to be seen pressing out from the distended ethmoid cell. Only one cell was affected.

CURRAN.

STRUYCHEN (66, **Empyema of the accessory sinuses with disturbances of the eye**) mentions two patients who suffered from asthenopia and severe intermittent headache caused by a chronic suppuration in the maxillary and frontal sinuses, and another case with an obstinate suppuration of the lacri-

mal sac, which was caused and maintained by a perforation from a sinusitis. In two cases in very old people rupture finally took place on the temporal side of the eye, after which the vision and the ocular movements again became normal.

VISSER.

XIII.—CONJUNCTIVA.

67. BOER. **Rare forms of tuberculosis of the eye and the lids.** *Archiv f. Ophthalmologie*, lxxv., 2, p. 273.

68. BORDLEY, J. **A case of pemphigus of the conjunctiva.** *Ophthalmic Record*, September, 1913.

69. CUENOD and PENEL. **Seven cases of gonococcal conjunctivitis treated with vaccine from the Pasteur Institute of Tunis.** *La clin. ophtalm.*, xix., p. 435.

70. ISHIHARA. **Contribution to the development of amyloid degeneration of the conjunctiva.** *Klin. Monatsbl. f. Augenheilkunde*, July, 1913, p. 65.

71. LINDNER. **Trachoma.** *Eighty-fifth Meeting of the German Naturalists and Physicians*, Vienna, September 21.

72. POPPEN. **Amyloid degeneration of the conjunctiva and the tarsal cartilage.** *Annales d'oculistique*, cl., p. 108.

73. ROSENHAUCH. **Two cases of actinomycosis of the eye.** *Klin. Monatsbl. f. Augenheilkunde*, June, 1913, p. 818.

74. SLAUCK. **Diphtheritic and similar diseases of the eye.** *Inaug. Dissert*,. Heidelberg, 1913.

BORDLEY'S (68, **Pemphigus of the conjunctiva**) patient, a man of 39, developed bullæ on the body and limbs, and died four months later. The bulbar conjunctivæ were filled with small hemorrhages which later became confluent, so that the conjunctiva was forced over the cornea. The inner surface of the lids was also filled with minute hemorrhages. The blood disappeared without leaving visible signs.

ALLING.

ISHIHARA (70, **Amyloid degeneration of the conjunctiva**) gives a description of the histology of two cases of this nature. In the first case, the amyloid evidently developed from the plasma cells; in the second, from the connective-tissue fibers. The writer, therefore, thinks that there must be at least two different ways in which amyloid of the conjunctiva may arise, and that the amyloid developing from plasma cells is responsible for local tumors, while that coming from the connective tissue may either remain local, or form a general amyloidosis.

POPPEN (72, **Amyloid degeneration of the conjunctiva and of the tarsus**) reports four cases of this nature, in three of which the patients were suffering from trachoma also. In one case with very bad trachoma the tarsal conjunctiva had formed so large a tumor that it had to be removed. The chemical and microscopic examination gave the typical reactions and pictures of amyloid degeneration. The degenerative process was equally marked in the places free from inflammation as in those where inflammatory changes had taken place. The degenerative changes involved all of the tissue elements, though to different degrees. The disappearance of the tarsal fibers was caused by the pressure of the growing mass of tumor, together with the degeneration.

CAUSÉ.

BOER (67, **Rare forms of tuberculosis of the eye and lids**) reports one case of tuberculosis of the tarsus, two of tuberculosis of the conjunctiva, one of the ciliary body, and one of the choroid with secondary involvement of the retina. Tubercle bacilli were not found in a single case. In four cases he found nodules composed of round cells, epitheloid cells, and giant-cells, one of which contained a cheesy spot. Portions of the diseased tissue were introduced into the anterior chamber of rabbits in three cases, from one of which a weakly positive reaction was obtained, from another no tuberculous changes, and from the third a panophthalmitis with a mixed infection. Operative treatment was successful in four cases, in which the disease affected the lids and the surface of the eyeball. In the two cases in which the disease was within the eye, enucleation was performed.

CUENOD and PENEL (69, **Gonococcal conjunctivitis treated with vaccine**) report good results from this treatment. The serum was injected intravenously in adults, subcutaneously in children. Each injection was followed in about an hour by a chill and a rise of temperature to 40°, but all symptoms had disappeared by the next morning and no other bad results were observed. Only two of the patients were infants, the other four were adults. One patient was cured by a single injection, the others required from four to eight injections at intervals of two or three days. Grave corneal lesions were present in two cases, but these healed with a comparatively

good result. The diagnosis of gonococci was confirmed in each case in the Pasteur Institute, and the vaccine was obtained from there. CAUSÉ.

SLAUCK (74, **Diphtheritic and similar diseases of the eye**) gives a clinical report with critical notes of seventeen cases of diphtheria and of diseases resembling diphtheria of the eye. Among these seventeen cases, in which mixed infection was common, the agent was the staphylococcus in six, the streptococcus in four, Loeffler's diphtheria bacillus in three, a bacillus closely resembling that of diphtheria in two, Morax–Axenfeld's diplobacillus in one, and the pneumococcus in one. The worst cases were those in which the staphylococcus, or a mixture of staphylococci and streptococci were found. Those with Loeffler's diphtheria bacillus were relatively benign, because of the injection of antitoxin, which was injected whenever there was a suspicion of diphtheria.

ROSENHAUCH (73, **Actinomycosis of the eye**) found yellowish granules, as large as grains of sand, on the tarsal conjunctiva of the right upper lid, which, when removed, left little depressions the bases of which were hyperæmic. They were found to consist of actinomyces albus. Another case was that of a child 11 months old, who had an ulcer of the cornea. The mass removed from the base of the ulcer proved bacteriologically to contain actinomyces albus acidus.

The most important characteristic of the pathological virus of the inclusion blennorrhea is its transmissibility to the conjunctiva of monkeys, according to LINDNER (71, **Trachoma**). This suffices to distinguish the disease from all other forms of conjunctivitis except trachoma. A differentiation of inclusion blennorrhea from trachoma by means of animal experiment is impossible, because exactly the same inoculation effect is produced by both on the conjunctiva of monkeys. This favors the theory the two diseases are ætiologically identical. This question could be settled only by comparison of the inoculation results on human conjunctivas of the same age, either of infants or of adults. A comparison from the conjunctivas of infants is impossible, because the trachoma of adults does not appear to occur in babies, and intentional infection has never been performed. Yet the course of trachoma in children allows a certain inference to be drawn as to

its possible course in infants. The striking characteristics of trachoma seldom appear in a child; the disease usually looks like a catarrh. He has never seen pannus in a child under the age of 5 years. Consequently inclusion blennorrhea fits in perfectly with what we know of trachoma at various ages. It usually starts as an acute conjunctivitis, but runs a chronic course, with occasionally the formation of granules later, which leave scars as they pass away. Lindner observed a case of inclusion blennorrhea which gradually developed the typical picture of trachoma in the course of two and a half years. It sometimes happens that one may accidentally find one or more minute scars in the upper tarsal conjunctiva in older children, in whom the conjunctiva is otherwise free from suspicion of trachoma. Lindner believes that almost all of these cases should be ascribed to slight and untreated inclusion blennorrheas during babyhood. The comparison of the inoculation effect of the two diseases upon the conjunctiva of adults gives the following: Infections with inclusion blennorrhea leads occasionally to very marked formation of granules, papillary hypertrophy, and healing with scars. It must, therefore, be diagnosed as trachoma. Pannus has developed in no case, because all have been treated from the beginning, so this cannot lie as an argument against the identity of the two diseases. But infections of inclusion blennorrhea in adults heal more quickly and better than the average case of fresh trachoma in trachoma regions. This does not justify, in his opinion, a division of trachoma into a mild and a severe form, for he thinks that it can be explained sufficiently by other factors. It is probable that the disease assumes a chronic and obstinate character wherever it is carried chronically from one eye to the other, as is the case in trachoma. Likewise a change and adaptation to the new conditions may readily result after several infections. The partial immunity in animals after infection with one disease to a subsequent infection with the other is also indicative of their identity.

KOELLNER.

XIV.—CORNEA AND SCLERA.

75. BAILLART and BLUTEL. **Lesions of the cornea in acne of the face.** *Arch. d'ophtalmologie*, xxxiii., p. 507.

76. FAGE. **Recurrences in interstitial keratitis.** *La clin. ophtalm.*, xix., p. 375.

77. FUCHS. **Dystrophy of the cornea in tabes.** *Centralbl. f. prakt. Augenheilkunde*, August–September, 1913.

78. JULER. **Acute purulent keratitis in exophthalmic goiter treated by repeated tarsorrhaphy, resection of the cervical sympathetic, and X-ray. Retention of vision in one eye.** *Ophthalmoscope*, xi., p. 456.

79. DE LAPERSONNE. **Scleral cysts from traumatic epithelial inclusion** *Centralbl. f. prakt. Augenheilkunde*, August–September, 1913, p. 265.

80. MUELLER, L. **Treatment of serpiginous ulcer.** *Eighty-fifth Meeting of the German Naturalists and Physicians*, Vienna, September 21.

81. SHOEMAKER, J. F. **Keratoconus and ectopia lentis.** *American Journal of Ophthalmology*, February, 1913.

82. STARR, E. G. **The use of a conjunctival flap in the treatment of corneal infections and pannus.** *Annals of Ophthalmology*, July, 1913.

83. WALLIS. **Interstitial keratitis (congenital syphilitic) treated by salvarsan.** *Ophthalmoscope*, xi., p. 342.

84. WIBO. **A modification of the treatment of interstitial keratitis due to hereditary syphilis, and of specific tertiary ulcers of the cornea.** *La revue clin.*, August 1, 1913.

JULER (78, **Acute purulent keratitis in exophthalmic goiter**), after describing his own case, says that in treating this complication of exophthalmic goiter an orbital incision and a free tarsorrhaphy should be the first step, and should be repeated if necessary. After splitting the lids a skin flap can be obtained from the region of the outer canthus and brought so as to relieve the tension. The resection of the sympathetic was of doubtful value in his case, while the X-ray to the thyroid gland seemed to help. CURRAN.

FAGE (76, **Recurrences in interstitial keratitis**) observed twelve recurrences in seventy cases of interstitial keratitis, 17%, in eight of both eyes, in four of one. The interval between the first and the second attack varied from six months to eight years. All were cases of hereditary syphilis.

CAUSÉ.

WIBO'S (84, **Modification of the treatment of interstitial keratitis due to hereditary syphilis**) modification consists of the instillation of a 3% solution of salvarsan into the conjunctival sac of the diseased eye, in combination with the general salvarsan treatment. At first this instillation causes irritation for a few hours; after one or two days a new formation of bright red vessels starts from the periphery of the cornea and

presses toward the center; then the cornea gradually becomes transparent. Cicatrization of syphilitic ulcers of the cornea takes place in a week. DANIS.

From a study of ten cases of interstitial keratitis treated with 606 and 914, WALLIS (83, **Interstitial keratitis treated with salvarsan**) concludes that these arsenic preparations shorten the time of recovery. He thinks it doubtful if 914 is quite as efficacious as 606. Repeated injections were given at intervals of ten days. In one case, however, when the affected eye had almost recovered under the treatment, the sound eye developed interstitial keratitis for which the patient is undergoing further injections of 606. It appears that these drugs may not prevent the future involvement of the unaffected eye in monocular cases. CURRAN.

STARR (82, **Conjunctival flap in the treatment of corneal infections**) advocates this treatment in nearly all cases of corneal ulceration, even including gonorrheal. In rodent and indolent ulcers, as well as pannus, it is especially efficacious. He incises the conjunctiva about the cornea, and cuts down from either end of the incision, dividing the conjunctiva backward, and forming a flap which is large enough to entirely cover the cornea to the opposite side, where it is held by sutures. ALLING.

BAILLART and BLUTEL (75, **Lesions of the cornea in acne of the face**) observed in five cases of acne rosacea characteristic corneal changes that went hand in hand with the attacks of acne. The patients were females from 22 to 60 years old, all of whom had gastric symptoms. Both eyes were affected in all, though not at the same time, an important point in the differential diagnosis from simple corneal ulcer. Usually there were several papular eruptions on the smooth cornea. As a rule, the course is that a papule lifts up the epithelium with infiltration of the vicinity, and soon cicatrizes into a dense leucoma. A little depression often forms in the midst of the eruption. The disease is characteristically apt to recur, either in the old place or in the form of new papules. The usual treatment was employed, but the results were less happy, on account of the recurrences. In one case the severe pain failed to be controlled until a bilateral iridectomy had been performed. CAUSÉ.

A patient of DE LAPERSONNE'S (79, **Scleral cysts from traumatic epithelial inclusion**), 19 years old, had been wounded with a knife in the right eye twelve years before, and presented a tumor in the inner-lower quadrant, which chiefly involved the sclera and encroached only a little on the cornea. The eye was blind and was finally enucleated on account of pain. The tumor proved to be a multilocular cyst that had developed in the sclera as the result of the perforating wound. The cyst was lined with conjunctival epithelium and communicated with the interior of the eye. In addition there was an excavation of the optic nerve (absolute glaucoma), as well as regressive changes in the choroid and retina. De Lapersonne supposes that at the time of the injury conjunctival tissue was carried into the interior of the eye, where it underwent cystic development both within the eye itself and in the region of the badly healed wound in the sclera. The question arises, he thinks, whether certain of the glaucomatous conditions that accompany staphyloma and ectatic scars may not be connected with the inclusion of corneal and conjunctival tissue in the eye.

FUCHS (77, **Dystrophy of the cornea in tabes**) reports a case of tabes in a patient who had been infected with syphilis in 1893 and had submitted to many courses of treatment. He had, in addition to an anisocoria, optic atrophy in both eyes, impaired vision, particularly of the right eye, and a temporal hemianopsia of the left, a peculiar condition on both corneæ. In the deepest layers of the lower quadrant of the cornea was an opacity consisting of minute, not very sharply defined, dirty gray to brownish points that formed small plaques below. Probably these were due to a degenerative process caused by the tabes, analogous to the degenerative changes of the cornea in pseudosclerosis.

In the treatment of ulcus serpens MUELLER (80, **Treatment of serpiginous ulcer**) has used for four years and found to be of great service the following preparation of balsam of Peru: balsam of Peru and castor oil, each one part thoroughly triturated together and then shaken up with eight parts of olive oil. The eye is anæsthetized with cocaine and adrenalin, and then a bit of cotton on an applicator is wet with the oil and held in contact with the ulcer for one or two minutes. It has proved serviceable not only in serpiginous ulcer, of which he

cured sixteen out of eighteen, but also in dendritic keratitis, and eczematous ulcers of the cornea. Recently he has used it in ophthalmia neonatorum after the application of a 4% solution of silver nitrate. Finally it may be used diluted in very chronic catarrhs that do not yield to any other form of treatment. KOELLNER.

SHOEMAKER (81, **Keratoconus and ectopia lentis**) presents the case of a woman, 27 years old, with these two conditions in both eyes. The vision of the right eye was about $\frac{20}{200}$ −, that of the left $\frac{20}{70}$, through the aphakic part of the eye with +8 D. The keratoconus appeared to be stationary. The dislocation of the lenses was downward.

ALLING.

XV.—IRIS AND PUPILS.

85. BELLWINKEL. **Herpes iridis.** *Inaug. Dissert.*, Munich, 1913.

86. BUKOLT. **Anisocoria in unilateral diseases of the lungs.** *Inaug. Dissert.*, Breslau, 1913.

87. FLEISCHER. **Two cases of unilateral melanosis of the sclera, iris, and fundus, with wartlike, little elevations on the anterior surface of the iris.** *Klinische Monatsblätter f. Augenheilkunde*, August, 1913, p. 170.

88. FUCHS and v. SCHWEINITZ. **The pathogenesis of chronic uveitis, with the exception of the syphilitic, tuberculous, and sympathetic forms.** *International Medical Congress*, London, August, 1913.

89. KRUEGER. **Congenital anomaly of the topographic conditions at the posterior pole of the eye, the papilla lying in the pupillary axis.** *Zeitschrift f. Augenheilkunde*, XXX., I, p. 21.

90. MAAS, O. **Reflex immobility of the pupil.** *Neurolog. Zentralbl.*, 1913, No. 15, p. 958.

91. SCHIECK. **Differentiation of the human and bovine types of tubercle bacilli by the production of experimental tuberculosis of the cornea and iris in rabbits, together with studies concerning the appearance and importance of the complement-fixing tuberculous antibodies.** *Publication of the Robert Koch Foundation for the Control of Tuberculosis*, 1913

92. SOMOGYI. **Vagotonic phenomena of the pupil.** *Wiener klinische Wochenschrift*, 1913, No. 33.

93. STIEFLER. **Isolated reflex immobiity of the pupil.** *Ibid.*, No. 28, p. 1185.

94. TRAPESONZEWA. **Tuberculosis of the eye.** *Medical Society of Moscow*, April 9, 1913.

95. WILLIAMS, C. **Heterochromia iridum.** *Ophthalmic Record*, July, 1913.

96. ZORAH. **A note upon essential oils in the treatment of iridocyclitis.** *Ophthalmoscope*, xi., p. 405.

WILLIAMS (95, **Heterochromia iridum**) found the right eye of his patient perfectly normal and the iris of a brown color. His left eye had a divergent strabismus and was totally blind, the iris being light blue. The lens was cataractous. The eye showed no signs of inflammation and had never done so. There was no increase of tension. Heterochromia is either congenital or acquired. In the latter form the discoloration may precede other manifestations of disease, such as cataract, choroiditis, optic atrophy, or glaucoma.

ALLING.

FLEISCHER'S (87, **Melanosis of the sclera, iris, and fundus**) first case was a girl of consanguineous parents who had a unilateral pigmentation of the deep layers of the sclera, an abnormal pigmentation of the iris, the surface of which was thickened and wartlike, and a pigmentation of the choroid. His second case had a blue violet scleral ring on one side, with a dark pigmentation of the iris, which had wartlike elevations on its surface, and a dark fundus. The parents were not related; the father had blue eyes, the mother brown. The condition in both was congenital and the pigmentation increased during the first year of life, just as in hypertrophic pigment moles of the skin. A malignant growth was excluded.

In the paper by FUCHS and v. SCHWEINITZ (88, **Pathogenesis of chronic uveitis**) Fuchs distinguishes five types from the microscopical standpoint. The fourth and fifth are the proliferating inflammations and show an infiltration of the tissue, and probably the pathogenic material exists first in the blood. The first three groups from toxic irritation have only superficial changes, the extent of which varies very much according to the reaction of the tissue. Von Schweinitz deals with gastrointestinal auto-intoxication. A rheumatic ætiology is very doubtful; absolutely positive observations that gout and diabetes can cause iritis are still wanting. The gonococcus plays only a small part in the chronic form. It is suspected that the staphylococcus can give rise to uveitis in chronic suppurative processes. It is difficult to exclude tuberculosis from the ætiology in all cases of iritis.

TRAPESONZEWA (94, **Tuberculosis of the eye**) reports a case of tuberculosis of the iris in a girl 7 years old. Her parents were healthy. There were no lesions of her internal organs,

and Pirquet's reaction was negative. An infection was possible from her grandmother, and from another woman who was intimate with the child, both of whom were tuberculous. The iritis was therefore primary. Enucleation of the eye became necessary on account of the great growth of the tuberculous masses. A guinea-pig inoculated with the material died within a month.

SCHIECK (91, **Differentiation of the human and bovine types of tubercle bacilli**) has found from numerous experiments that by the introduction of diluted emulsions of tubercle bacilli into the anterior chambers of rabbits these two types may be differentiated; the human type produces a slight tuberculosis of the iris or cornea which heals, the bovine results in caseation and loss of the eye. The courses of the two when inoculated into the aural vein are almost the same, but the differentiation is distinct when the inoculation is into the common carotid. The marginal phlyctenulæ, which are produced by inoculation after a certain time and run characteristic courses, are true local lesions of the inoculated tuberculosis.

KRUEGER (89, **Anomaly of the posterior pole of the eye**) observed in a man 19 years old, who consulted him on account of bad vision and strabismus, that the papilla lay directly in the pupillary axis of the eye, a rare condition. Otherwise there was nothing abnormal. The eyes were divergent during fixation, and the vision, after correction of a hypermetropic astigmatism, was $\frac{5}{20}$ and $\frac{5}{30}$.

BUKOLT (86, **Anisocoria in unilateral diseases of the lungs**) found the pupils unequal in twenty-three out of thirty-five cases of pneumonia, 65.7%. The pupil on the side of the disease was dilated in fourteen, contracted in nine. This phenomenon was much more uncommon in unilateral pleurisy, 1:4 in the dry, 5:10 in the exudative form. It was present in 58.3% of the cases of tuberculosis of one lung, mydriasis in seven, myosis in five, of the pupil on the affected side; this symptom is most frequent in the second stage of the disease. Taking all the observations together, the pupils were unequal in size in sixty-five out of ninety-four cases, 69.1%; thirty-nine with mydriasis, twenty-six with myosis.

STIEFLER (93, **Isolated reflex immobility of the pupil**)

exhibited in connection with a paper on pupillary disturbances in syphilitic nervous diseases a case of bilateral reflex immobility of the pupil of isolated character, with paresis of the accommodation of the left eye following syphilis. The Wassermann was +. The case was one of early onset of cerebrospinal syphilis, and improved after specific treatment. The only objective signs, aside from the immobility of the pupils, were a feeling of dazzling in daylight, and pain radiating in the head, neck, and limbs. Infection occurred three and a half years before.

SOMOGYI (92, **Vagotonic phenomena of the pupil**) says that a change in the pupils accompanies respiration, dilatation with deep inspiration, and contraction with full expiration. The phenomenon is met with most often in young people, especially when they are phthisical, and is due to an increased liability of the vagus center.

MAAS (90, **Reflex immobility of the pupil**) reasons from common experience that reflex immobility of the pupil is met with usually in tabes and paralysis. But there are cases in which both of these diseases can be excluded, and then syphilis is generally present. He reports such a case; the diagnosis of syphilis was not positive, but the woman had given birth to two dead children. The histological changes in the brain and spinal cord showed arteriosclerosis. Other cases are known in which the cause seemed to be chronic alcoholism. He thinks that positive proof that syphilis is not present is hard to obtain. Immobility of the pupils sometimes precedes by a long time the other characteristic signs of tabes. Chronic alcoholism induces a slow reaction, often immobility, but that this immobility due to alcohol may be permanent needs proof. Reflex immobility without syphilis is rare.

BELLWINKEL (85, **Herpes iridis**) has collated the clinical histories of nine cases of herpes iridis. The clinical picture is very similar to that of herpes zoster and herpes corneæ, especially in the monolateral attacks of blebs, headache, and neuralgia. In herpes iridis there are added swellings in the pupillary portion of the iris and hemorrhages into the anterior chamber. The latter are recurrent and may prolong the duration of the disease Usually it is accompanied by a herpetiform keratitis, which shows very little tendency to heal.

Hence the given duration of three to five weeks is often exceeded, and the neuralgic pains in particular may persist for a long time. Complications that occur are increase of tension, posterior synechiæ, occlusion of the pupil, and optic neuritis. Among the results are applanatio corneæ, macula corneæ, anæsthesia of the cornea, leucoma, and impaired vision. As regards the ætiology, the infectious diseases are responsible, particularly influenza and acute articular rheumatism. The diagnosis presents scarcely any difficulty, the only thing with which it may be confounded being a syphilitic roseola of the iris. The prognosis is bad, as recurrences are frequent and complications cannot be prevented. The treatment is commonly that of iritis, but whether atropine or eserine should be used depends on the tension of the eye, and sometimes a paracentesis of the anterior chamber is necessary.

In iritis and cyclitis of non-specific origin ZORAH (96, **Essential oils in the treatment of iridocyclitis**) gives internally oil of cinnamon, cloves, or peppermint in doses of from two to four minims every four hours. It cuts short the attack in a remarkable manner, and he has used the treatment as an adjunct to the routine methods for over ten months. He says that by substituting these essential oils for mercury and iodide most cases can be cured in three or four weeks and some in a few days. CURRAN.

XVI.—LENS.

97. ASK. **Treatment of luxations of the lens.** *Klin. Monatsbl. f. Augenheilkunde*, September, 1913, p. 331.

98. CHALUPECKY. **The influence of the ultra-violet rays on the lens of the eye.** *Wiener med. Wochenschrift*, 1913, Nos. 31 and 32.

99. ELSCHNIG. **Statistics of wounds of the eye with pieces of iron.** *Centralbl. f. prakt. Augenheilkunde*, 1913, p. 230.

100. FUCHS. **Opacification of the lens following suppuration of the cornea.** *Annales d'oculistique*, cl., p. 81.

101. HOLLOWAY, T. B. **Unusual types of punctate cataract.** *Ophthalmic Record*, August, 1913.

102. VERREY. **Spontaneous absorption of a senile cataract.** *Arch. d'ophtalmologie*, xxxiii., p. 566.

HOLLOWAY (101, **Unusual types of punctate cataract**) observed three cases, two brothers and a sister, that showed by oblique illumination irregular central opacities in the an-

terior cortex of the lens beneath the capsule, grayish in color, but at points presenting a bluish tint. There were also numerous small irregularly round dots of bluish tint, scattered throughout the anterior layers, as far as could be seen with the dilated pupil. A similar appearance was found in the posterior cortex. The nucleus was clear. He relates five other cases of central anterior and posterior punctate opacities blue or greenish blue. They are probably congenital.

ALLING.

FUCHS (100, **Opacification of the lens following suppuration of the cornea**) deals particularly with the histology of the first stages of anterior polar cataract. One of the earliest changes is a rarefaction and vacuolization of the epithelial cells, preceded by an elongation with slight swelling and pallor of the cells, and a distinct change in the form of the nuclei. Then follows a proliferation of epithelium in one or more places, due to the effort always made by the epithelium to cover denuded places as quickly as possible. Thus the destruction of cells by the toxins present in the aqueous during purulent affections of the cornea, stimulate to a certain degree the epithelial cells adjacent to the defect. The elongation and proliferation of cells can be observed earlier in children than in adults. He saw a man 71 years old, who had a fairly dense capsular cataract two weeks after the perforation. The commencement of the epithelial coating of the posterior surface of the cataract was to be seen three weeks after the perforation; the complete and regular coating could be seen only in older cases. Exceptionally the proliferation of the epithelial cells takes place through the direct stimulation of the toxins without cell destruction. The capsular cataract may also be produced in this way without previous perforation, and it may also be produced by adhesion of the lens capsule to the corneal cicatrix, or, in rare cases, by a solution of continuity of the capsule.

CAUSÉ.

VERREY (102, **Spontaneous absorption of a senile cataract**) reports the case of a man 66 years old, from one of whose eyes a cataract had been extracted twenty years before, and in whose other eye a ripe cataract had been treated with myotics because of glaucoma. The cataract in this eye finally underwent complete absorption, leaving a vision of $\frac{1}{6}$ with + 1.5 D.

Both eyes had formerly been highly myopic. He points out that pathological changes were present in the majority of cases hitherto observed, and that these seemed to favor the absorption of cataract, perhaps by the formation of apertures in the capsular epithelium. Glaucoma is the most common, and is perhaps produced by the swelling cataract, and on the other hand facilitates absorption. CAUSÉ.

ELSCHNIG (99, **Wounds of the eye with pieces of iron**) reports concerning sixty-eight cases observed within six years. Seven were situated deep in the cornea; fourteen in the anterior chamber or iris; twenty in the lens; twenty-one in the vitreous; three in the sclera; three had passed completely through the eyeball. Eight were infected from the start, five became so later. Of the remaining fifty-four, twenty-two eyeballs had to be sacrificed, the rest recovered with more or less vision. He has often advised to remove such a foreign body from the lens as quickly as possible, yet he would qualify this when a detachment of the retina is present, as in one of his cases, by waiting, as the conditions for extraction are more favorable later. The choice whether to use a hand magnet or a giant magnet must be made in each case individually.

ASK (97, **Luxation of the lens**) says that in general the outlook for a successful treatment of a luxated lens is not very good. Intrabulbar luxations, especially the incomplete, or subluxations, are always apt to excite inflammation, especially of the uvea and retina, either through its action as a foreign body, or because of chemical changes. This inflammation may be acute and severe, or slow and creeping. The question whether to operate or not is a difficult one to decide. Waiting is justified when the eye is not irritated; if diplopia is constantly present the eye may be covered with an opaque glass. Subluxation becomes complete very easily. When the lens is opaque and the interior of the eye cannot be watched, it is best to advise operation, as experience has shown that inflammatory changes are apt to develop slowly in the eye. The nature of the operation must depend on the case. The lens must be removed if in any way possible, but when this cannot be done other procedures may be necessary to obviate its bad effects, as cyclodialysis, or trephining of the sclera when it has excited a glaucoma. When the luxated lens lies in the

anterior chamber it is possible for it to cause no reaction and even to become absorbed, but as a rule its removal is necessary, and this may be rendered difficult by adhesions. Luxation into the vitreous is extremely serious, and the consequent complications are often of such a nature as to necessitate enucleation. The subconjunctival is the commonest extrabulbar luxation, and it is well to delay operation in these cases until the scleral wound is healed because of the danger of sympathetic ophthalmia. The lens should then be removed as soon as possible.

CHALUPECKY (98, **Influence of ultra-violet rays on the lens**) says that electric accidents often give rise to an opacity of the lens, which as a rule first becomes noticeable after some months. The external signs of the disease resemble those of electric ophthalmia, or of snow blindness, troubles in which the influence of the strong electric irradiation comes into account even though the current did not strike the body. The external signs are inflammation of the conjunctiva and cornea, and hyperæmia of the iris. Observations of various writers show that the rays of long or medium wave-length are the chief factor in the production of intraocular changes, while the short-waved, the chemically active, produce inflammations in the anterior portion of the eyeball. It is shown experimentally that the ultra-violet rays induce opacities of the lens, as well as the external changes in the eye.

XVII.—VITREOUS.

103. TERTSCH. **Vessels in the vitreous in a case of panophthalmitis.** *Zeitschrift f. Augenheilkunde*, July, 1913, p. 18.

TERTSCH (103, **Vessels in the vitreous in panophthalmitis**) found in an eye enucleated for panophthalmitis vessels jutting out into the vitreous far from the level of the retina. He thinks that a laceration of the limitans interna and extension of the layer of fibers of the retina by the suppuration was the essential cause of this condition.

XVIII.—CHOROID.

104. BRAV, A. **Sarcoma of the choroid.** *Jour. A. M. A.*, Aug. 13, 1913.

105. COLLINS. **A pathological report of a case of Doyne's choroiditis ("honeycomb" or "family" choroiditis).** *Ophthalmoscope*, xi., p. 537.

106. MELLER. **An epithelial tumor of the ciliary body.** *Archiv f. Ophthalmologie*, lxxxv., 2, p. 191.

BRAV (104, **Sarcoma of the choroid**) enucleated a hard, painful eye, in the case of a girl aged 18, and found it filled with a melanosarcoma. The patient remained in perfect health, bore two children, but developed sarcoma of the liver and died eight years after.

ALLING.

COLLINS (105, **Doyne's choroiditis**) finds hyaline substance in varying thickness,—sometimes in well-marked nodules in the region of the membrane of Bruck. This substance shows laminations very like a number of superimposed layers of the elastic lamina. The nodules have the same staining reaction and microscopic appearance as "Drusen," but differ from the latter in that they are not isolated nodules, but accompany a general thickening of hyaline substance. Collins thinks it likely that the primary change was in the pigment epithelium, and that the changes in the choroid and retina were secondary to pressure caused by the formation of hyaline substance.

CURRAN.

MELLER (106, **Epithelial tumor of the ciliary body**) had the opportunity to examine an eye that contained an epithelial growth of the ciliary body. The eye had been blinded by inflammation a long time before; perforation had taken place, and a dense mass was present in the anterior chamber. When the epithelial neoplasm began could not be ascertained with certainty. It was not an inflammatory proliferation, as its structure was atypical, and it infiltrated the old mass, the ciliary body, and the iris, which was partially replaced by the growth, and extended into the vitreous. Its unrestrained growth and its destructive tendency marked it as malignant. Histologically the tumor was characterized by originally cuboidal or cylindrical epithelial cells deposited immediately upon each other and later became irregular in arrangement. The connective-tissue stroma came for the most part from the original tissue, to a less extent from direct new formation.

XIX.—SYMPATHETIC OPHTHALMIA.

107. BOULAI. **Enucleation or evisceration.** *La clin. ophtalm.*, xix., p. 503.

108. CRAMER. **Anaphylactic origin of sympathetic inflammation.** *Klin. Monatsbl. f. Augenheilkunde*, August, 1913, p. 205.

109. DIMMER. **A remarkable case of sympathetic ophthalmia.** *Eighty-fifth Meeting of the German Naturalists and Physicians*, Vienna, Sept. 21, 1913.

110. FRANKE. **Relations of lymphocytosis to injuries of the eye and to sympathetic ophthalmia.** *Archiv f. Ophthalmologie*, lxxxv., 2, p. 318.

111. KRAILSHEIMER. **Clinical and histological demonstrations of sympathetic ophthalmia.** *Medical Soc. of Silesia and Posen*, June 23, 1913.

FRANKE (110, **Lymphocytosis in injuries of the eye and sympathetic ophthalmia**) deals with the very important question whether the increase of lymphocytes has a prognostic or diagnostic connection with sympathetic ophthalmia. A marked lymphocytosis was present in three out of seven cases of injury less than a month old, although healing had taken place with no irritation. Another case with lymphocytosis had a relatively benign iridocyclitis. No lymphocytosis was present in three; two of these eyes were enucleated and showed nothing characteristic of sympathetic ophthalmia. Lymphocytosis was present in seventeen out of twenty-six cases of older injury, including four in which the eyes were inflamed, over 30%. It was also present in five out of ten cases of old injury of the cornea. The presence of lymphocytosis years after the injury is striking, even after enucleation or evisceration. Absence of lymphocytosis is no guarantee that sympathetic ophthalmia will not develop later. Lymphocytosis occurs after injuries in which sympathetic ophthalmia is scarcely to be expected, and may be absent when it is clinically threatened, hence its presence or absence is of no diagnostic or prognostic importance.

Although CRAMER (108, **Anaphylactic origin of sympathetic inflammation**) has doubted the anaphylactic origin of sympathetic ophthalmia, he has been led to look favorably upon the theory by Peters's report of deafness connected with the disease, and by a case of his own. A woman 38 years old had a traumatic luxation of the lens into the anterior chamber, whence it was removed, leaving behind a snow-white band. Recovery was uneventful, except for the formation of posterior

synechiæ. Four months later she reappeared with sympathetic ophthalmia in the other eye. In addition she was very deaf, and the deafness increased considerably after removal of the injured eye. She also suffered from vertigo, so that a disease of the internal ear had to be assumed, as there were no signs of trouble in the middle ear. Hearing improved gradually, together with the vertigo. The general condition otherwise was negative. Five months later the patient had become very bald, while the few remaining hairs on the scalp were snow-white and sparse, as were also the eyelashes, eyebrows, and the hairs in the axillæ and about the pubes.

DIMMER (109, **A remarkable case of sympathetic ophthalmia**) reports the case of a 10-year-old boy whose eye had been wounded in December, 1909. Three weeks later he found a corneal scar with incarceration of the iris, a severe papilloretinitis, and a beginning iritis, which caused an ever increasing thickness of the iris. Five weeks after the injury the disease began in the other eye. Coincidently with the iritis a papilloretinitis appeared in this eye also. The iris became enormously thickened in both eyes, with numerous nodules, so that perforation seemed to be threatened in the sympathizing eye, which in fact occurred in the injured one, as shown by the subsequent pathological examination. When the right eye had only perception of light the boy came down with a febrile sore throat, during which the thickening of the iris in the injured eye retrogressed somewhat. The injured eye was enucleated ten weeks after the injury. At this time the sympathizing eye could only count fingers at three meters. During an intercurrent attack of infectious sore throat and bronchitis the grave condition of the left eye improved remarkably, so that the vision became $\frac{1}{3}$, later almost $\frac{1}{2}$. The ophthalmoscope showed only slight trouble in the papilla and retina, with patches of sympathetic choroiditis in the periphery. Examination three years later revealed cataract, perhaps a little lowered tension, good perception of light and projection. The relatively good result of so grave a process seemed to have taken place under the influence of the febrile diseases, as in the case of sympathetic ophthalmia observed by Ahlstroem in 1904. One might be inclined to agree with the latter that the artificial production of such intercurrent diseases was

indicated for the treatment of the sympathetic ophthalmia. The simultaneous appearance of a grave papilloretinitis with the iritis in this case is also worthy of note. The examination of the enucleated eye showed a very great thickening of the iris and ciliary body together with the histological condition characteristic of sympathetic ophthalmia. As soon as the eyeball was opened numerous white patches could be seen macroscopically in the fundus, which corresponded to those visible with the ophthalmoscope in the other eye. The substratum of these patches was composed of proliferations of non-pigmented cells from the pigment epithelia, such as have been repeatedly described in this disease. KOELLNER.

KRAILSHEIMER (111, **Sympathetic ophthalmia**) examined both eyes of a trachomatous patient in whom sympathetic ophthalmia developed after the perforation of a corneal ulcer, and found typical changes. In another patient who had sympathetic ophthalmia after cataract extraction, the examination of the enucleated eye, in which the tension was increased, showed typical changes with a relatively slight involvement of the choroid. Good vision was preserved in the remaining eye. In a third case, the sympathetic inflammation expressed itself by vitreous opacities, and slight optic neuritis, and especially numerous, little, roundish, whitish spots placed close together and scattered over the entire periphery. The examination of the enucleated, injured eye gave the well-known histological picture.

BOULAI (107, **Enucleation or evisceration**) is emphatic that when sympathetic ophthalmia is threatening, enucleation alone is justified as a safe procedure, so long as the path of the disease to the other eye is not surely known. Evisceration does not suffice. CAUSÉ.

XX.—GLAUCOMA.

112. ABADIE. **Prognosis of glaucoma.** *La clinique ophtalm.*, xix., p. 506.

113. ALT, A. **Extraordinary alterations in the corneal epithelium of a glaucomatous eye.** *American Journal of Ophthalmology*, February, 1913. *Klin. Monatsbl. f. Augenheilkunde*, June, 1913, p. 816.

114. AXENFELD. **Late infection after trephining operations.**

115. AXENFELD. **Remarks on the London discussion concerning the new operations for glaucoma.** *Ibid.*, September, p. 383.

116. BETTREMIEUX. **Simple sclerectomy in acute glaucoma.** *Annales d'oculistique*, cl., p. 97.

117. BOEHM. **Pathology and treatment of congenital hydrophthalmos.** *Medical Society of Silesia and Posen*, August, 1913, p. 251.

118. ELLIOTT, R. H. **Trephining in glaucoma, acute and chronic.** *Ophthalmoscope*, xi., p. 523.

119. HARMS. **A case of late infection after Elliott's trephining.** *Klin. Monatsbl. f. Augenheilkunde*, September, p. 380.

120. ISAKOWITZ. **A case of late infection after Elliott's trephining.** *Ibid.*, June, p. 714.

121. KUHNT. **Late infection after Elliott's trephining.** *Zeitschrift f. Augenheilkunde*, August–September, p. 137.

122. MELLER. **Lagrange's sclerectomy and Elliott's trephining.** *Meeting of the German Naturalists and Physicians*, Vienna, September, 21, 1913.

123. SCHUR. **Detachment of the retina after Elliott's trephining.** *Klin. Monatsbl. f. Augenheilkunde*, September, p. 372.

124. SCHUR. **Late infection after Elliott's trephining.** *Ibid.*, p. 377.

125. VAN LINT. **T-shaped sclerotomy.** *La clin. ophtalm.*, xix., p. 362.

ALT (113, **Alterations in the corneal epithelium in glaucoma**) found an interesting vesicular change on the cornea of an eye which had been removed for chronic glaucoma. In several places the epithelium was raised by an accumulation of round cells and connective tissue. Vesicles were also formed by the stretched epithelium having only a thin connective-tissue membrane within. In the upper half of the cornea he found a pannus-like thickening of dense connective tissue between Bowman's membrane and the epithelium which was not like spring catarrh or an atrophied pterygium. In view of the findings, described as found in the lower part of the cornea, he suggests that this may be connective tissue which had grown into a very large epithelial vesicle.

ALLING.

AXENFELD (115, **The London discussion on the new operations for glaucoma**) questions whether the fistulization, so strongly insisted upon at London, is always attained. The cushion formation is absent in many cases in which a good result is secured by the operation, and whether the frequency of the signs of filtration runs parallel to the frequency of the therapeutic final result must be learned from time and the observation of much more material. As success doubtless occurs without visible filtration, it must be supposed that either

to a certain degree microscopic filtration takes place, or that other factors take part, as in simple sclerotomy of cyclodialysis. Possibly the iridectomy plays an essential part. As this is performed almost always, the question arises whether Elliott's trephining is not a simple modification of the incision for iridectomy, which presents certain technical advantages. Trephining is the easier when the anterior chamber is shallow, and it permits the piece of iris to be excised to its root, while the aqueous usually flows away more slowly. At the moment when the wall of the eyeball is perforated the margin of the pupil, if it is free, makes a little movement toward the place of trephining. He thinks the classical iridectomy best for acute inflammatory glaucoma, as well as for other forms, especially since we are now able to make the diagnosis early by means of tonometry and the visual field, but still there are many cases that can be saved only by means of a fistulizing operation.

ABADIE (112, **Prognosis of glaucoma**) maintains that the surest operation as yet for either chronic or acute glaucoma is iridectomy, and that it is only when this fails that other procedures should be tried. Myotics do not suffice in these cases. Other methods are needed in simple glaucoma in which the inefficiency of iridectomy has been demonstrated. The prognosis depends more on the surgeon than on the disease. CAUSÉ.

BETTREMIEUX (116, **Simple sclerectomy in acute glaucoma**) subscribes to the idea the excision of a piece of iris is not the important factor in iridectomy, but that the efficiency of the operation depends on the change in the scleral wall. Accordingly he performed a non-perforating, the so-called simple, sclerectomy in a case of acute glaucoma, intending it only as a preliminary operation to a later iridectomy, but the result was so good that the iridectomy was not needed.

CAUSÉ.

MELLER (122, **Lagrange's sclerectomy and Elliott's trephining**) reports 389 sclerectomies, 12% for acute glaucoma, 61.5% for chronic inflammatory glaucoma, 9% for simple glaucoma, the rest for other varieties. Total iridectomy was performed in more than half the cases, peripheral in 30%, none at all in 4%. The duration of observation was five years. A cystoid cicatrix was produced in more than half of the cases,

in 11% the scar was ectatic, in 23% quite flat. There is no certain connection between the form of the scar and the intraocular tension. The result was good in 70%, bad in 10%. Opacity appeared in the lens in 4% of the cases; posterior synechiæ developed in the great majority. A severe iridocyclitis developed in 2.3%. Enucleation was necessary in 3.4%. In addition six eyes became atrophic, but were not enucleated. Late infection destroyed 1.3%. Loss of vitreous occurred in 6.2%. Two eyes were lost from expulsive hemorrhage. This complication appeared less in acute than in chronic glaucoma. Glaucoma simplex gives the best chances, with 2.8% of loss. Recurrences took place in 11.3%, in simple glaucoma in 14.3%, in acute and chronic in 6%. Recurrences occurred in 7% of the cystoid cicatrices, in 16% of the flat, in 24% of the ectatic. Then follows a description of the abnormal softness of the eyes and its consequences. He also reports 178 cases of Elliott's trephining, and compares the method with that of Lagrange. Trephining is less dangerous, gives the same chances with regard to the production of a cystoid cicatrix, and resulted badly in only 2.4%. The less iridectomy is performed the more frequent are the recurrences. He concludes that Elliott's method is to be preferred to Lagrange's. Iridectomy is its efficient factor. From experience thus far it cannot be generally recommended to substitute trephining for Graefe's iridectomy, but in the difficult and bad cases it can be used with advantage. It is also preferable to sclerectomy in hydrophthalmos, because it affords less danger of loss of vitreous and it exerts a favorable influence.

KOELLNER.

ELLIOTT (118, **Trephining in glaucoma**) believes that trephining is the operation of choice for both acute and chronic glaucoma, though he does not now advocate trephining in the majority of cases of glaucoma secondary to cataract, because this condition is most frequently met with in intumescent cataract, in which the cortical substance being fluid, or semifluid, tends to block the trephine hole. He says that no further argument is needed to show that the operation is applicable to the treatment of even very acute glaucoma. It is the easiest, safest, and most reliable method of doing a sclerotomy. In iridectomies he advises dissecting the conjunctival flap right

up to the limbus before introducing the keratome, for if trephining is to be done later, there will be no difficulty in carrying the dissection of the flap to the cornea. If this is not done, the cicatricial tissue makes it harder for a trephine to be applied later. In a large number of doubtful cases, where it was necessary to see the disk in order to confirm the diagnosis, he has used homatropine followed by a myotic. This he considers a perfectly safe procedure. He has tried the method of reducing tension advocated by Thomas of California, subconjunctival injections of solutions of pure crystallized sodium citrate, with disappointing results. They also produced adhesions which made operation more difficult afterwards. Subconjunctival injections should be made in a place away from the site for a trephine hole. The less connective tissue in the conjunctiva, the easier it is to split the cornea. Elliott found that the size of the more anterior trephine hole could be reduced to 1.5*mm*, and is still in doubt whether this could not be further reduced to 1*mm*. As a precaution against hemorrhage he favors the slow performance of the operation, so as to allow the aqueous to escape gradually. In 900 cases of trephining he cannot recall a single experience of intraocular hemorrhage. CURRAN.

AXENFELD, HARMS, ISAKOWITZ, KUHNT, and SCHUR (114, 119, 120, 121, 124, **Late infection**) report cases in which late infection took place. In Isakowitz's case the trephine opening was 1.5*mm* in size, the conjunctival flap sutured. The patient did well for six weeks and then an infection of the anterior chamber took place through the opening, which ran a threatening course, but did not result in panophthalmitis. In Axenfeld's case the infection took place nine months after a sclerectomy. Infection followed trephining after four months in Kuhnt's case, after eight months in Harms's. The latter thinks that the epithelium of the swollen cushion was excoriated by the movements of the eye. In Schur's case the injured eye received a blow about six weeks after the operation, panophthalmitis developed, and the eye had to be enucleated. There was an ulcer of the conjunctiva near the place of trephining, from which the pus cells extended through the episcleral tissue toward the opening, which had smooth margins and lay peripherally, so that the stump of the iris and the

ciliary process lay in the wound. The pus passed through this portion of the uvea directly into the vitreous, while the anterior chamber contained only a few pus cells.

VAN LINT (125, **T-shaped sclerotomy**) dissects up a large flap of conjunctiva, introduces a keratome 2 to 2.5*mm* from the limbus, so as to produce an iridodialysis in most cases, after which a total or a peripheral iridectomy is performed. One blade of a pair of scissors is then introduced vertically to this incision into the anterior chamber and an incision 3 or 4*mm* long is made, forming the vertical branch of the T. Finally the conjunctival flap is drawn down over the cornea and secured in place just above its horizontal meridian by two sutures that have been inserted before the commencement of the operation. He has operated on twelve cases of various forms of glaucoma in this manner and had excellent results. The chief advantage of the operation is the persistence of a good filtering cicatrix. One of the results of the conjunctival flap is the formation of new veins which facilitate the circulation with the posterior chamber and the opening of the sinus of the anterior chamber. The vertical incision of the sclerotomy is particularly favorable to the escape of aqueous; the subconjunctival fistulous scar causes an accelerated excretion of aqueous, which is particularly important to the healing of glaucoma. CAUSÉ.

BOEHM (117, **Pathology and treatment of congenital hydrophthalmòs**) examined eight cases of buphthalmos; in most of them there were fissures of Descemet's membrane, and in some defects of Bowman's membrane. The lens was often displaced, in three it lay on the epithelium of the posterior surface, like an embryonal lens. In one traces of the tunica vasculosa lentis were present. The anterior chamber was obliterated in most, freely open in only one. In three the entire iris lay on the posterior surface of the cornea. Schlemm's canal was often rudimentary, sometimes absent, or partially replaced by a solid cord. Occasional disturbances of development were present, such as a fetal construction of the ciliary muscle. Three had detachment of the retina, one together with detachment of the choroid, which in still another occurred alone. Iridectomy had been performed on four eyes, but the scars were scarcely visible. Complete excision of the iris

had been attempted in only one. Cyclodialysis was performed in six cases that were observed only clinically, and was followed in four by slight complications. Its effect was less than that of iridectomy or sclerotomy. Posterior sclerotomy also had not proved successful. The earlier the operation was performed the better were the results. A permanent cure is rare.

XXI.—RETINA.

126. AXENFELD. **Retinitis externa ossificans simulating a subretinal tumor.** *Meeting of the German Naturalists and Physicians*, Vienna, Sept. 21.

127. BALLANTINE. **Pulsation of the retinal arteries.** *Ophthalmoscope*, xi., No. 8.

128. BAYER. **Angioid pigment striation of the retina.** *Klin. Monatsbl. f. Augenheilkunde*, p. 766.

129. ELSCHNIG. **Retinal tumors.** *Meeting of the German Naturalists and Physicians*, Vienna, September 21.

130. HEGNER. **Pathology of the embolic metastases in the eye.** *Klin. Monatsbl. f. Augenheilkunde*, p. 753.

131. MELLER. **The nature of the so-called Hippel's disease of the retina.** *Archiv f. Ophthalmologie*, lxxxv., p. 255.

132. OLIVER. **Thirteen cases of hereditary transmission of retinitis pigmentosa in two generations.** *Ophthalmoscope*, xi., p. 407.

133. SAUTTER, A. C. **A case of macular hole.** *Annals of Ophthalmology*, July, 1913.

134. STERN. **Angiomatosis of the retina, the so-called v. Hippel's disease.** *Centralbl. f. prakt. Augenheilkunde*, 1913, p. 298.

In seventy-five cases in which BALLANTINE (127, **Pulsation of the retinal arteries**) found locomotor pulse, twenty-five had organic disease of the heart. Five of these had aortic regurgitation and in twenty the tricuspid and mitral valves were involved, chiefly the latter. He found the expansile pulse in thirty-two cases, all of which had organic disease of the heart. In thirteen cases he found the capillary pulse with signs of aortic regurgitation in twelve of these, and in one case the pressure pulse was found to be due to aortic regurgitation. According to Ballantine the locomotor pulse in its slighter form is not pathological. Excitement and debilitating disease in which there is a loss of vascular tone favor its occurrence. The expansile pulse is very frequent in aortic incompetence,—occasionally in healthy persons. He found the expansile pulse in aortic regurgitation in combination with aortic steno-

sis and with every other valvular lesion, as well as in pericarditis. When a well marked expansile pulse is present, it is practically always accompanied by an equally well marked locomotor pulse. About half of the cases which showed the expansile pulse had also the capillary pulse on the disk. The pressure pulse, while most commonly described as a symptom of glaucoma, has been seen in aortic regurgitation, and sometimes in ophthalmic examinations it gives warning of impending syncope. CURRAN.

SAUTTER (133, **A case of macular hole**) describes a case in which a large patch of old retinochoroiditis surrounded the nerves, which were atrophic on the temporal side. In the macular region was a sharply defined, somewhat depressed, dark red area about the size of the disk. It was surrounded by a broad, grayish white ring. There was a history of traumatism. The hole was larger than most of those described. ALLING.

In an otherwise intact eye, with vision except for a central scotoma there developed, according to AXENFELD (126, **Retinitis externa ossificans simulating a subretinal tumor**), in a man 60 years old, a subretinal whitish gray prominence that had so characteristically the appearance of a tumor that the eye was enucleated. Under the microscope no tumor was found, but a condition closely resembling the retinitis exudativa externa described by Coats as occurring in young people and frequently mistaken for glioma, but the phenomenon has not hitherto been observed in a seeing eye that it contained an extensive ossification. The choroid was involved but little and only secondarily. The same process was accurately followed in the other eye, in which the picture of a tumor developed with hemorrhages visible at its margin.

KOELLNER.

ELSCHNIG (129, **Retinal tumors**) describes first a case of sarcoma of the retina met with in a woman 22 years old. A yellowish, prominent tumor appeared in the region of the macula two years before and had led to increase of tension, amaurosis, and total detachment of the retina. The pathological examination revealed just in front of the papilla a large spindle-celled leucosarcoma, with numerous cystic formations in the retina. The case was exactly like the retinal tumor

described by Schieck as a perithelioma. His second case was one of a retinal tumor of a kind apparently not yet known, met with in a 15-year-old boy who had been blinded by iridocyclitis and secondary glaucoma. The neoplasm occupied the most anterior portion of the retina up to the ora serrata, and consisted of a fibrous basal tissue with very abundant epitheloid cells, convolutions of vessels, and hyaline degenerations in places. The columnar epithelium was proliferated at one place into a cystlike, much folded membrane composed of a single layer, the cells of which showed in many places a direct transition into the retinal tumor. He calls this tumor a neurinoma, or a neurocytoma. It is possible that such neoplasms occur frequently in cases of apparently idiopathic detachment of the retina with secondary glaucoma without iritis, and it may be that they have certain relations to Hippel's angiomatosis. KOELLNER.

STERN (134, **Angiomatosis of the retina**) saw a case of Hippel's disease. There was an angiomatous dilatation of the superior temporal vein, which formed a network of lagunæ over the entire retina, the beginning of which, he thought, could be seen at one place. It had numerous, small, parallel, newly formed vessels, which probably united to form a larger one.

MELLER (131, **Nature of Hippel's disease of the retina**) believes this disease to be a gliomatous degeneration of the retina in which the dilatation and tortuosity of the retinal vessels, with their aneurysmic dilatations and new formation of convolutions, are not to be taken as signs of a primary vascular disease or angiomatosis. The vascular changes appear to be the more marked the more diffuse is the pathological process in the retina. The principal lesion seems to be a proliferation of the glia tissue. The proliferation of the vessels is reactive. The presence of cystic spaces is common in glioma. The red spots are convolutions of vessels.

BAYER (128, **Angioid pigment striation of the retina**) describes two cases of this nature. In both circular pigment striæ surrounded the papilla, and from these other lines radiated into the periphery. In places these striæ, which resembled vessels, were interrupted by patches that had the color of arteries. Bayer says that these phenomena indicate a disease

the ætiology of which is unknown and will remain so until the question of its pathology has been solved.

HEGNER's (130, **Embolic metastases into the eyes**) patient suffered from articular rheumatism, mitral insufficiency and stenosis, and a high degree of aortic insufficiency. His right eye was blinded by an embolism of the central artery. Microscopic examination revealed the rare picture hitherto not described, of a bulging of the arterial wall, which was inflamed. The condition was therefore one of aneurysm of the central artery.

OLIVER (132, **Hereditary transmission of retinitis pigmentosa**) traces thirteen cases of twenty descendants in two generations from one ancestor similarly afflicted.

XXII.—OPTIC NERVE AND THE VISUAL TRACT.

135. AHRENS. **A tumor of the chiasm.** *Naturwissench. med. Gesellsch. Jena*, July 10, 1913.

136. BONNEFOY and OPIN. **Gumma of the chiasm.** *Arch. d'ophtalm.*, xxxiii., p. 477.

137. CALHOUN, F. P. **The report of a case of optic atrophy caused by uterine hemorrhage.** *Ophthalmic Record*, July, 1913.

138. GIRI. **On concretions in the optic nerve.** *Ophthalmoscope*, xi., p. 390.

139. LANGENBECK. **Differential diagnosis of retrobulbar affections of the optic nerve.** *Medical Society of Silesia and Posen*, June 28, 1913.

140. DE LAPERSONNE. **Optic meningitis in recent syphilis.** *Arch. d'ophtalmologie*, xxxiii., p. 465.

141. PERTHES. **Tumor of the hypophysis.** *Muench. med. Woch.*, p. 1746.

142. RADOS. **Cavernous degeneration of the optic nerve.** *Klin. Monatsbl. f. Augenheilkunde*, September, 1913, p. 355.

143. RUSSWOOD, C. S. **Pseudoneuritis.** *Ophthalmoscope*, xi., p. 530.

144. UHTHOFF. **A case of central congenital amaurosis with bilateral atrophy of the occipital lobes.** *Medical Society of Silesia and Posen*, June 28, 1913.

AHRENS's (135, **Tumor of the chiasm**) patient developed a left temporal, then nasal, then right temporal hemianopsia. The pupillary reaction was hemianopic, the fundus normal, and the X-ray showed the sella turcica to be normal. A tumor of the hypophysis being thus excluded the ethmoid cells were curetted out with a good result. The case was one of rhinogenous disturbance of the optic nerve due to chronic disease of the posterior accessory sinuses.

BONNEFOY and OPIN (136, **Gumma of the chiasm**) give the clinical and pathological description of a gumma of the chiasm in a woman 34 years old, who had acquired syphilis six years before, which had scarcely been treated. The symptoms of syphilitic disease of the base of the brain developed quite rapidly in a classical manner. The most important sign was the loss of intelligence, which reached almost complete dementia and rendered a test of the vision and of the visual field impossible. The first symptom observed was a paresis of the left oculomotorius. Ophthalmoscopically only a slight discoloration of the papilla was visible, which was explained by the very rapid course of the disease. The lesion was situated behind and in the chiasm, the gumma extending diagonally forward from left to right. The most of it was on the left side, where it had completely destroyed the oculomotor nerve and the origin of the optic-nerve bundle. In the region of the chiasm itself the greater part of the tumor was on the right side, had pressed the chiasm to the left, and had started from an enormous periarteritis of the right carotid artery. Microscopically a descending degeneration of hour-glass form was present in the retrobulbar portion of each optic nerve. All of the cranial vessels, large and small, showed extensive changes in the way of an obliterating endarteritis, particularly those between the chiasm and the cerebrum. The almost complete absence of changes in the optic-nerve sheaths was striking. CAUSÉ.

PERTHES'S (141, **Tumor of the hypophysis**) patient suffered from bitemporal hemianopsia and moderate headache caused by an adenoma of the hypophysis in acromegaly. After operation the vision of the left eye was improved.

LANGENBECK (139, **Retrobulbar affections of the optic nerve**) gives the various causes that may produce retrobulbar affections of the optic nerve, which are multiple sclerosis, heredity, syphilis, diseases of the accessory sinuses, pregnancy, diabetes, loss of blood, and traumatism. These may be divided into four principal groups. Most cases in which no explanation can be found are due to a beginning multiple sclerosis.

In order to explain better the manifold clinical symptoms of early syphilitic disease of the optic nerve, DE LAPERSONNE

(140, **Optic meningitis in recent syphilis**) assumes a meningeal inflammation of the optic nerve, or of its sheaths, along its course from the optic foramen to its entrance into the eyeball. The arachnoid is first attacked, and from there the inflammation extends secondarily to the interfascicular interspaces, where the nerve fibers are injured. This theory of an optic meningitis is based upon the examination of the cerebrospinal fluid, which is particularly rich in cellular and polynuclear elements. It is also borne out by the pathological condition. He has three methods of treatment, according to the severity of the case. The first consists of twenty to thirty injections of sublimate oil at intervals of two or three days; the second of a series of twelve mercurial injections, followed by three or four intravenous injections of salvarsan, 25 to 40 centigrams, at intervals of eight days, and then another series of mercurial injections; in very bad cases he begins at once with salvarsan, and follows this with injections of mercury.

CAUSÉ.

In a study of concretions in the optic nerve and fundus, seen in cases from Fuchs's clinic, GIRI (138, **Concretions in the optic nerve**) pleads for a classification of such concretions according to their anatomical position and histogenesis, rather than calling them "colloid," "amyloid," "hyaline," etc. He points out that the staining reactions which led to this classification vary as to the age and the position of the concretion, and thus the names, as denoting an identical condition, become misleading. He agrees with Streiff in thinking that "Drusen" depend upon an alteration of the lymph, or a disturbance in its circulation. Such a condition may lead to small deposits of insoluble albuminoid substance from the lymph. The change may continue either for a long or a short time.

CURRAN.

RADOS (142, **Cavernous degeneration of the optic nerve**) describes two cases of this nature. The first was one of a thrombosis of the central vein, which resulted in secondary glaucoma and cavernous degeneration of the optic nerve. To judge from the connective-tissue organization of the thrombus, and the degree to which the layer of optic-nerve fibers was loosened up, the thrombus must have existed for a long time. The local changes at the site of the thrombus were

very slight, but they reached a higher degree in the retinal veins. The second case presented the same picture. These cases seem to confirm Gilbert's idea that circulatory disturbances play an important part in the origin of cavernous degeneration.

Disturbances in the eye following remote hemorrhages are well known. CALHOUN (137, **Optic atrophy caused by uterine hemorrhage**) saw a case in which, ten days after a very severe uterine hemorrhage, the woman became totally blind. Just how soon after the bleeding the blindness occurred is not known, on account of the collapsed condition of the patient. Three weeks later the vision began to return. When first examined after three months, the right vision was $\frac{20}{60}$, the left $\frac{15}{200}$. The disks were pale and the retinæ anæmic. The fields showed marked contraction with partial hemianopsia.

ALLING.

RUSSWOOD (143, **Pseudoneuritis**) recognizes two classes of pseudoneuritis, those which show swelling, and those which do not. He calls the first pseudopapillœdema, the second pseudoneuritis. This is the more common, especially in children, and he thinks that it is most certainly congenital, "whereas pseudopapillœdema is, on the evidence available, not congenital, and most probably represents a persistent condition of œdema of the optic papilla which for some reason does not interfere with the function of the optic nerve."

CURRAN.

UHTHOFF (144, **Central congenital amaurosis with bilateral atrophy of the occipital lobes**) gives the findings in a case of congenital central amaurosis, which proved to be due to a past symmetrical encephalitis of both occipital lobes. There was perivasculitis of the small and medium-sized vessels, a uniform atrophy of the medulla in the affected parts of the brain, and a formation of vacuoles under part of the external cortical layer. The pia was thickened and showed inflammatory infiltration in places. Hence the condition was not an encephalomalacia, but an old encephalitis.

XXIII.—ACCIDENTS, INJURIES, FOREIGN BODIES, PARASITES.

145. BRUNETIÈRE. **Filaria loa in the eye the possible cause of cerebral complications.** *Annales d'oculistique*, cl., p. 100.

146. Von Grosz. **Experiences with eye magnets.** *Meeting of the German Naturalists and Physicians*, Vienna, September 21, 1913.

147. Kraus. **Injuries of infants' eyes during labor.** *Nuremberg Medical Society and Polyclinic*, May 8, 1913.

148. Mathewson, G. H. **Two cases of snow blindness.** *Ophthalmic Record*, July, 1913.

149. Vinsinneau. **Tetanus following injury to the eye.** *Arch. d'ophtalm.*, xxxiii., p. 418.

Kraus (147, **Injuries of infants' eyes during labor**) reports two cases of injury with forceps during labor. In the first an opacity of the cornea was caused by laceration of Descemet's membrane, in the other the eyeball was torn completely out by the blade of the forceps during the passage of the child through a contracted pelvis.

Mathewson (148, **Snow blindness**) points out that the severer cases of this condition are probably accompanied by corneal ulcers due to the rupture of blisters similar to those on the skin in sunburn. He had two cases of sunburn from being exposed to the glare from snow, each showing shallow ulcerations.

Alling.

Brunetière (145, **Filaria loa in the eye the possible cause of cerebral complications**) saw a sudden attack of right hemiplegia in a man 30 years old who had been living for some years in the Congo, and had had a subconjunctival filaria loa eight years before. In the absence of medical help the patient placed a pepper broth of the natives between his lids and the filaria disappeared to be seen no more. Before the onset of the hemiplegia he showed other symptoms of filariasis, such as Calabar swellings, and this diagnosis was confirmed by repeated examinations of his blood. The ætiological diagnosis of the hemiplegia was made by exclusion to be an embolism of filariæ in the terminal twigs of the artery of the left Sylvian fossa. An almost perfect recovery took place.

Causé.

Von Grosz (146, **Experiences with eye magnets**) says that when the place of entrance of the foreign body is open, which is rather rarely the case, an attempt is justified to try to remove it through this wound with either the hand magnet, or the innenpolmagnet. To remove small foreign bodies from the interior of the eye, they should be guided by the giant magnet

into the anterior chamber, and removed from there with a hand magnet through an incision with a keratome. When the foreign body is large it should be removed through a scleral incision, as otherwise it is apt to do damage to the anterior portion of the eye. The innenpolmagnet is particularly well suited to this class of cases. When the foreign body is of medium size the condition of the lens, whether it is uninjured, or is the seat of a traumatic cataract, should determine the choice of operation. In the former case there is danger that the lens may not be spared by a sharp-edged medium-sized foreign body, if Haab's operation is attempted.

KOELLNER.

VINSONNEAU (149, **Tetanus following injury to the eye**) observed a case of tetanus that proved fatal within ten days after an insignificant, scarcely noticed wound of the conjunctiva, by a piece of wood lying on the ground, in a young man 18 years old. Panophthalmitis set in four days after the injury, the eye was enucleated on the next day, and two days later tetanus was plainly present, which resulted in death in three days in spite of energetic serum treatment. It is always well to use prophylactic injections of serum when possible, in cases of doubtful or of telluric nature. When tetanus has already set in, the wound should be opened as widely as possible. Vinsonneau prefers enucleation to exenteration in these cases because one is thereby better able to exclude an injury of the orbit, or the presence of a foreign body that has passed through the eyeball. He concludes from his observations that the prognosis for life is worse in tetanus due to an injury of the eye or orbit than it is generally, and is also the worse the earlier the disease sets in after the injury, the more the muscles of the face are involved, the deeper and the more vascular is the wound, the later the foreign body is removed, and the later the preventive injection of serum is made. CAUSÉ.

IV.—Der Wert der Bindehautdeckung bei perforierenden Bulbusverletzungen und Cornealgeschwüren (On the Value of the Conjunctival Flap in Perforating Injuries of the Eyeball and Corneal Ulcers). By Dr. BERTHOLD KREVET, *Sammlung wissenschaftlicher Arbeiten*, Vol. 7. Langensalza, 1913. Published by Wendt & Klauwell.

In the introduction the author states the remarkable fact that this method, which is of such great benefit to mankind, had to be discovered three times independently before it was generally adopted. Alexander Pagenstecher as early as 1861 had covered corneal ulcers with a conjunctival flap. In 1876, H. Schöler again came forth with it, and finally Kuhnt's publications in 1883 made it universally known.

Schöler was first to establish distinct indications when and how to use the conjunctival flap and devised six different methods of forming it. He also published sixteen successful cases. But in the following years nothing is found on the subject either in special or in general medical journals. This explains the fact that Kuhnt in 1883 published his method without having any knowledge of Schöler's work. The intentions of both authors in their use of the conjunctival flap differ in one respect. While Kuhnt uses it with the purpose of reparation of lost tissue, Schöler applies it as a temporary cover. Kuhnt aims to create actually new scleral or corneal tissue, and Schöler wants to guard the endangered parts by covering them temporarily.

After an extensive report of all literature on the subject the author proceeds with his own statistics. From 1906 to 1912 at the clinic in Giessen, eighty-four cases of injury had been treated with the conjunctival flap. To this number must be

added nine cases of progressive ulcer which likewise had been treated with good results. In these nine cases the flap had been used either to prevent perforation, or, if such had already taken place to cover it after the prolapse of iris had been cut off.

Of the eighty-four cases of injury, sixteen showed signs of infection soon after the operation. This is in conformity with the number of enucleations made—that is, seventeen. That includes four eyes in which the inflammation would not abate and threatened the other eye with sympathetic ophthalmia. Two bulbi could only be saved in form, two others became phthisical. All the rest, even of the most destructive nature, healed well. He now relates more extensively twenty-two of his own cases. The fact that in seventeen out of eighty-four cases the eye could not be saved is to be explained by the long time elapsed between the injury and the beginning of the treatment. But even then in a number of extremely severe injuries some vision had been retained. Even in cases in which the eye could be saved only in form or as a phthisical eye, the result, in as much as it could be done without endangering the other eye, must be claimed as satisfactory, so much more, as these eyes, when they came under treatment, apparently seemed to be lost.

As to the methods employed, he states that in eleven cases two-pedicled flaps were used. In forty-eight cases the conjunctiva was drawn over in total. In seven cases this method was modified in such a way that the conjunctiva was united over the cornea without having been previously loosened. In these cases the experience was gained, first, that this method gave satisfactory results; secondly, that it allowed a constant inspection of cornea, anterior chamber, and iris. This modification may prove to be advisable in cases of small injuries near, or in the margin of the cornea. However, the relaxation of the conjunctiva by means of cuts is not to be neglected as in a few cases the edges of the wound would overlap.

The good results obtained by the use of the conjunctival flap, such as immediate cessation of pain, good adaptation of the edges of the wound, are certainly due to the quick mechanical closure of the wound and its protection from infection. In many cases, which could be termed desperate, relatively

good vision was obtained. By this method harm can never be done, but many an eye, which otherwise would be lost, can be saved.

SCHALCK.

V.—Die Beziehungen der Thränenorgane zur Nasenhöhle und zu ihren Nebenhöhlen (The Relationship of the Lacrimal Passages to the Nose and its Accessory Cavities). Prof. A. ONODI. Urban & Schwarzenberg. Berlin and Vienna, 1913.

Renewed attention has been drawn to the important relationship of the lacrimal passages to the nose, by the appearance of this atlas of Professor Onodi. The anatomy and the topography of the parts are first reviewed, then the ætiology of lacrimal disease and its treatment are given. A number of rhinological operations are described which have recently been advocated for the operative treatment of lacrimal obstruction. The indication for operations from a rhinological standpoint the author places as follows:

1st. The Toti operation (dacryocystorhinostomia) when the sac is very ectatic.

2d. When the sac is not distended a window-resection above the inferior turbinal is advised, according to the procedure of West.

3d. The von Eicken operation, namely an opening of the lacrimal duct from the maxillary sinus, is indicated in maxillary sinusitis, or where the stenosis of the duct is extensive and the nasal conditions are against an endonasal operation.

The atlas, like all of Professor Onodi's well-known anatomic studies, is particularly characterized by excellent plates of anatomical dissections. The value of these is, of course, self-evident. The accompanying text appears in both English and German.

A. K.

CORRESPONDENCE.

143 HARLEY STREET, LONDON, W.,
March 24, 1914.

TO THE EDITOR OF THE ARCHIVES OF OPHTHALMOLOGY.

DEAR SIR:

Will you permit me to answer Dr. Fergus's letter which appears in your issue just received by me (Vol. XLIII., No. 2).

Dr. Fergus first raised the same contentions in *The Ophthalmoscope* for February, 1910. I answered him in the same journal for April, 1910, refuting his contentions. He *never* answered me in that journal.

He dropped the subject for more than two years, and then revived it in the *British Medical Journal* of June 22, 1912. I answered him in the same journal for August 31, 1912, pointing out that his letter was full of very serious inaccuracies on questions of facts. He replied on September 14, 1912, and I again replied on December 14, 1912. I showed clearly *from his own writings* that whatever operation Dr. Fergus had performed, *the one he himself stated he performed, the one his colleague in his own city understood he performed, and the one capable onlookers gave it as their opinion that he performed*, was quite different from that which I have advocated from the first.

Once again and for the second time, Dr. Fergus failed to meet my arguments in a British journal in which he had started the discussion, and for the very obvious reason that no answer was possible.

After another interval, this time of more than a year's duration, he has re-started in a foreign journal the old contentions which he has twice failed to support in a British journal.

I leave his action to the judgment of your readers, only asking any who are sufficiently interested in a discussion, of which I for one am heartily tired, to read the letters in the British medical journals above quoted.

I have never wavered from the position I took up in my first letter to ***The Ophthalmoscope*** in April, 1910, where I said: "I have no wish to claim priority, but I wish to assert most positively that I did my work in absolute independence of Dr. Fergus."

Regretting to trouble you on so threadbare and uninteresting a topic,

Yours truly,

R. H. ELLIOT,
Lt. Col., I.M.S.

MISCELLANEOUS NOTES.

The SECTION ON OPHTHALMOLOGY of the British Medical Association, which holds its meeting at Aberdeen on July 29th, 30th, and 31st, has selected the three following subjects for discussion, with the names of the gentlemen to open them:

"The Choice of a Cataract Operation." Mr. E. E. Maddox.

"The Hygiene of Reading and Near Vision." Mr. J. Herbert Parsons.

"The Teaching of Ophthalmology to Medical Students." Dr. Maitland Ramsay.

Members or foreign visitors are invited to read papers, give demonstrations, or exhibit any specimen or apparatus of ophthalmological interest.

At the Ophthalmic Meeting of the Clinical Congress of Surgeons of North America in London, the following addresses have been arranged for Friday evening, July 31st, at 8:30 o'clock:

"Experiences with Trephining in Glaucoma." Colonel Elliot and E. Treacher Collins.

"Strabismus Operations." F. Richardson Cross and N. Bishop Harman.

"Cataract Procedures." E. E. Maddox and W. T. Holmes Spicer.

A new journal entitled *Zentralblatt für die Gesammte Ophthalmologie und ihre Grenzgebiete* is to be brought out by Prof. Dr. A. Bielschowsky, Marburg; Prof. Dr. A. Elschnig, Prag; Prof. Dr. E. Hertel, Strassburg; Prof. Dr. E. v. Hippel, Halle; Prof. Dr. F. Schieck, Königsberg; Prof. Dr. A. Siegrist, Bern;

under the supervision of Prof. Dr. W. Krauss, Marburg. It is to be a complete review of all practical and theoretic achievements in the field of ophthalmology. It is to appear fortnightly, will be published by Julius Springer, Berlin, and will cost 25 M. a volume.